

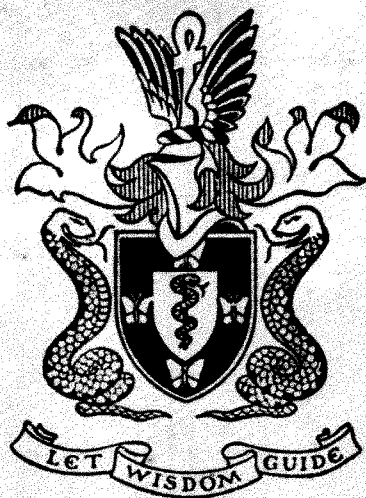
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Vol. 125

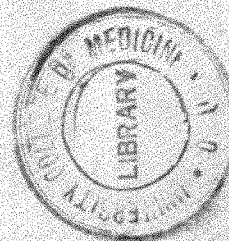
July 1974

# THE BRITISH JOURNAL OF PSYCHIATRY

The Journal of Mental Science



6



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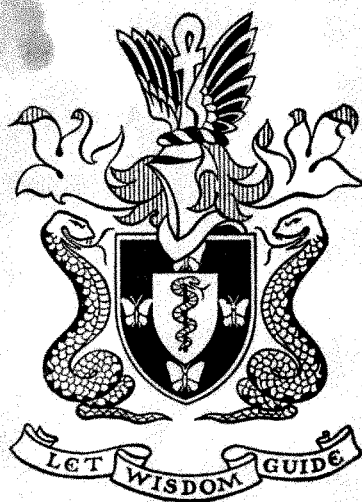
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- 1 *Modern Med.* 17, 438, 1972
- 2 *Practitioner*, 210, 135, 1973
- 3 *Am. J. Psychiatr.* 130, 1142, 1973
- 4 *Practitioner*, 198, 80, 1967
- 5 *J. Roy. Coll. Gen. Practit.* 23, Suppl. 2, 33, 1973
- 6 *Practitioner*, 199, 325, 1967

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*A new adjunct to the treatment and management of depression: intravenous infusion of clomipramine (Anafranil). S. Afr. med. J., 45, 68 (1971)*

72% (of 57 patients) showed a very good or good response and 96% made some improvement. This compares very favourably with the response of similar groups of severely depressed patients to E.C.T., and it is postulated that intravenous chlorimipramine can be offered as an alternative form of treatment."

Oral group: 78 per cent showed a very good or good response and 96 per cent improved to some extent. This is also compared favourably with the results obtained with other antidepressant drugs in similar groups of patients."

*Parenteral and oral chlorimipramine treatment of depressive states. Brit. J. Psychiat., 122, 189 (1973)*

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*Anafranil in obsessional states—a follow up study. Paper read at the V World Congress of Psychiatry, Mexico D.F. 1971.*

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*Clomipramine (Anafranil) in the treatment of obsessional illnesses and phobic anxiety states. J. Int. Med. Res., 1, 403 (1973)*

"It is our view that clomipramine not only gives good results in severe and moderate depressive states, but it is emerging as the treatment of choice in obsessive compulsive disorders and phobic states."

*Letter, Treating phobias. World Medicine, 7, 11: 15 (1972)*

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*Clinical impressions on treatment of obsessional states with intravenous clomipramine (Anafranil). J. Int. Med. Res., 1, 413. (1973)*





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Androcur has proved to be of value in treating men who have been guilty of sexual offences such as exhibitionism; paedophilia; indecent assault; rape; incest; voyeurism; bestiality and paederasty.

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##### Presentation

Each round, white, 9 mm tablet is embossed on one side with 'BY' in a regular hexagon, and is scored on the other. It contains 50 mg cyproterone acetate (6-chloro-17 $\beta$ -hydroxy-19, 21-methylene-pregn-4,5-dione-3,20-dione acetate).

##### Uses

Treatment of severe hypersexuality and sexual deviation in the male. Cyproterone acetate acts as an anti-androgen by blocking androgen receptors. It also has progestogenic activity which exerts a negative feedback effect on the hypothalamic receptors, so leading to a reduction in gonadotrophin release, and hence to diminished production of testicular androgens.

The sum of these actions permits the control of excessive and misdirected male libido.

##### Dosage and administration

The average daily dose is 100 mg (2 tablets). If no response is apparent after 4 weeks, the dose can be increased to 200 mg a day, or even to 300 mg a day for a brief period. Several months may be needed to develop the full effect. When satisfactory control of libido has been well established, a lower maintenance dose should be determined by reducing the dosage not more often than every 1-2 weeks and by no more than 25-50 mg in the daily dose at each reduction.

The daily dosage should always be divided, owing to the poor absorption (10-30%) and rapid metabolism of Androcur.

##### Contra-indications

Acute disturbances of liver function.  
Malignant tumours and wasting diseases (because of transient catatonic action).  
A history of thrombosis or embolism.

Severe chronic depression.

##### Side-effects

Inhibition of spermatogenesis. The sperm count and the volume of ejaculate are reduced. Infertility is usual, and there may be azoospermia after 8 weeks. There is usually slight atrophy of the seminiferous tubules. Follow-up examinations have shown these changes to be reversible. Spermatogenesis usually reverts to its previous state about 15 months after stopping Androcur, or, in some users, up to 20 months. That spermatogenesis can recover even after very long treatment is not yet known. There is no evidence that abnormal sperm might give rise to malformed embryos or produced during treatment with Androcur.

Tiredness, fatigue and lassitude are common in the first few weeks but become much less so from the third month.  
Gynaecomastia. About one patient in five develops transient or

perhaps in some cases permanent enlargement of the mammary glands. In rare cases gynaecomastia and tender benign nodules have been reported.

Other changes that have been reported in isolated cases, some of which may be true side-effects of Androcur are:

Testicular pain.  
Transient patch loss and reduced growth of the hair, increased growth of scalp hair and lightening of hair colour.  
Healing of acne vulgaris.  
Weight changes.  
Female fat distribution and abdominal distension.  
Skin rashes.  
Headaches.  
Autonomic imbalance (gastro and vasomotor disturbances, sweating, flushing, fluctuations of blood pressure etc.).

##### Precautions and special information

Chronic liver disease. Although contra-indicated in acute liver disease, Androcur shows good liver tolerance in general. Nevertheless, liver function tests should be done before and every 4-6 weeks during treatment in patients who have chronic liver disease.

Diabetes. Androcur can influence carbohydrate metabolism. Extra care is advised in poorly-stabilised diabetics and the levels of glucose in the blood and urine should be examined in all diabetics or prediabetics prior to, before and every 4-6 weeks during treatment.

Chronic alcoholism. Alcohol appears to reduce the effect of Androcur, which is of no value in chronic alcoholics.

Haemoglobin. Hypochromic anaemia has been found rarely during long-term treatment, and blood counts before and at intervals of 4-6 weeks during treatment are advisable.

Nitrogen balance. A negative nitrogen balance is usual at the start of treatment, but does not persist.

Spermatogenesis. A spermatogram should be recorded before starting treatment in patients of procreative age, as a guard against attribution of persistent infertility to Androcur at a later stage. It should be noted that the decline in spermatogenesis is slow, and Androcur should, therefore, not be regarded as a male contraceptive.

Immature youths. Androcur should not be given to youths whose bone maturation and testicular development are incomplete.

Medico-legal considerations. Doctors are advised to ensure that the fully-informed consent of the patient to Androcur treatment is witnessed and can be verified.

Road Safety. The marked lassitude and asthenia that may be experienced, particularly during the first few weeks of treatment,

necessitate especial care while driving.

Note. Cyproterone acetate has been found to cause liver abnormalities in animals, including the development of tumours, but the relevance to man of this finding has not been established.

##### Pharmaceutical precautions

Store in cool, dry conditions away from strong sunlight. Shelf-life five years.

##### Legal category S4b

Package quantities Bottles of 50 tablets.

##### Product Licence Number

0053 0023.

Further information is available from

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3. APPEL, K. A. (1959) Religion, in *American Handbook of Psychiatry* (ed. Arieti). New York.

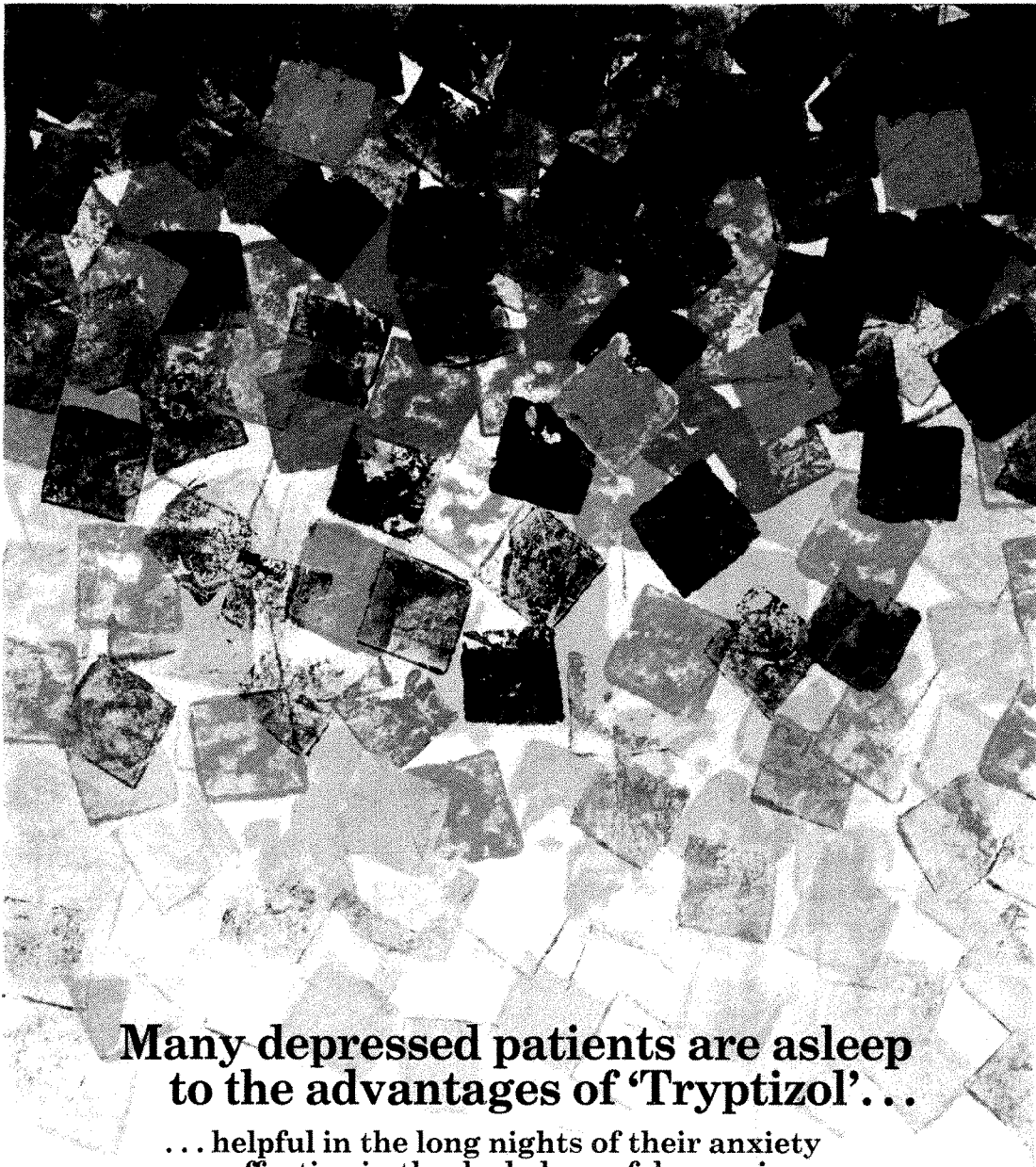
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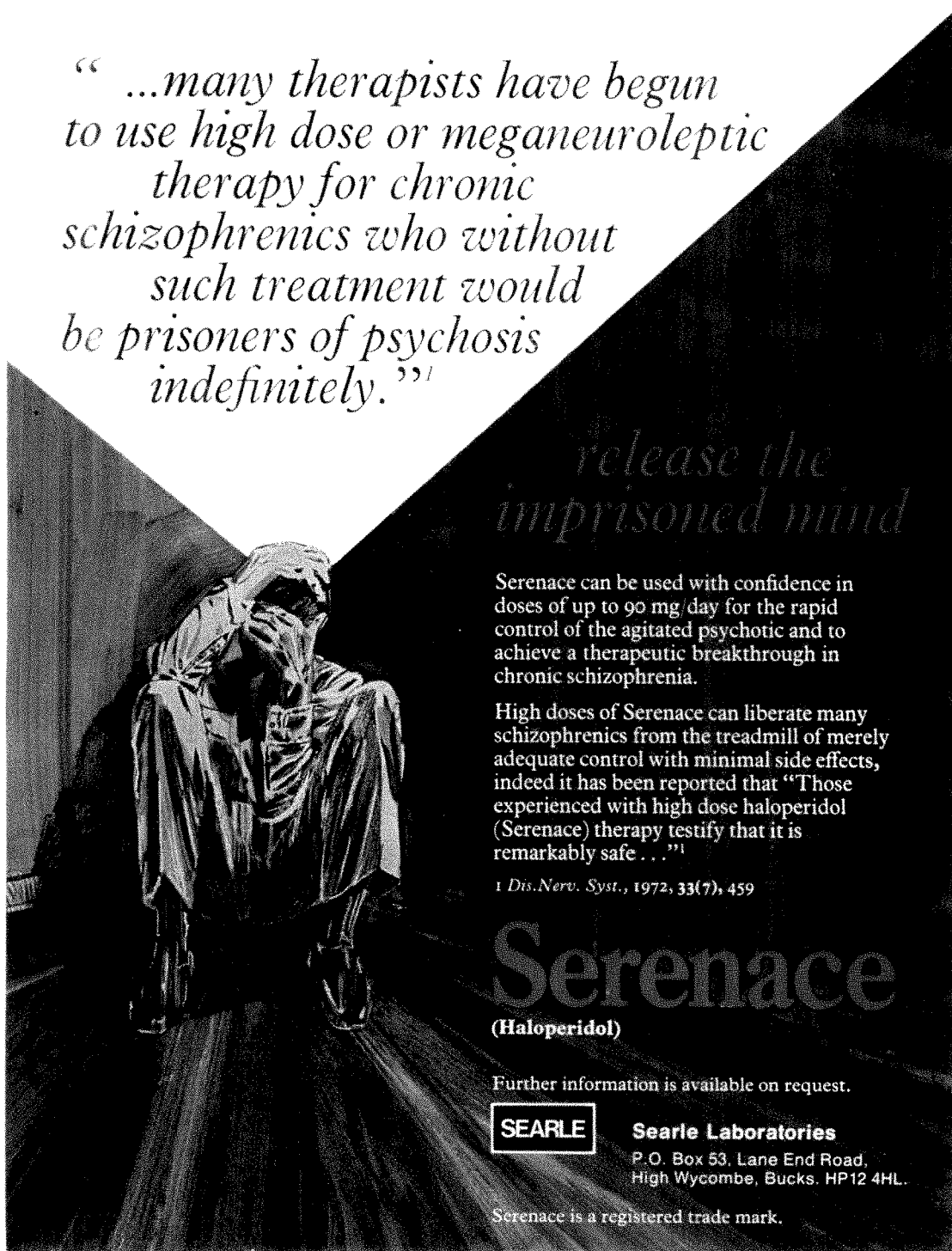
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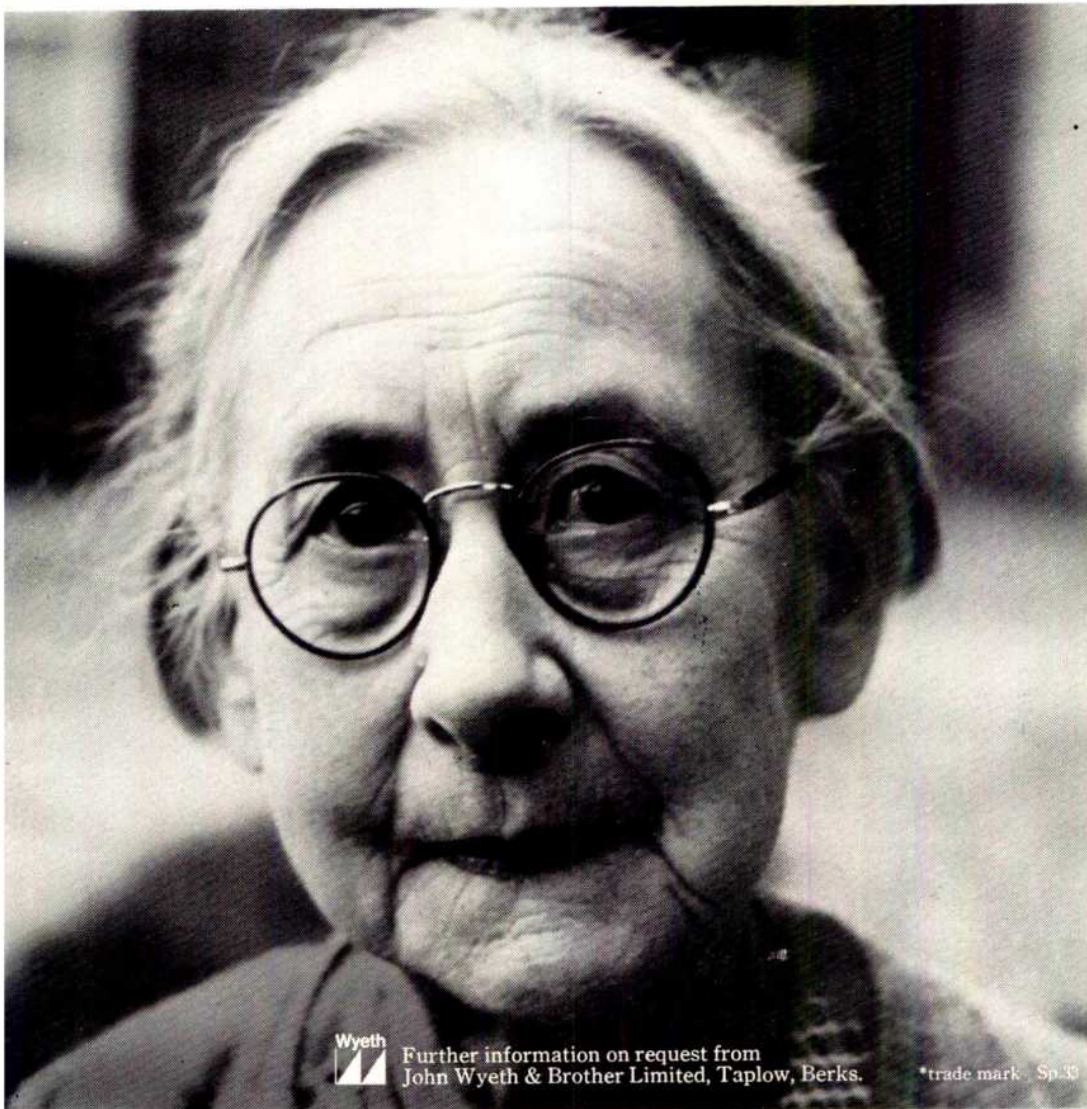
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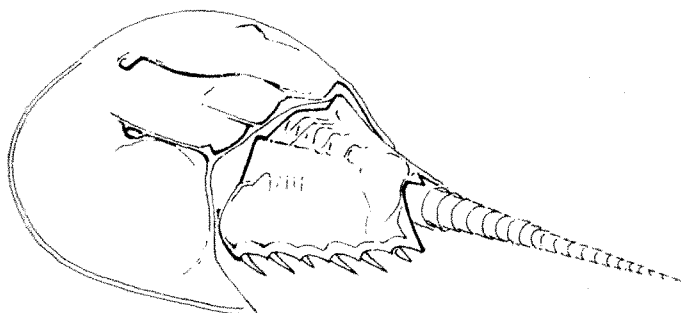
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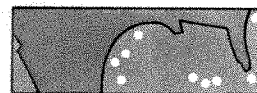
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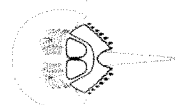
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\*Barwin, B.N., et al., *Practitioner*, 211, 669, 1973.

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#### Legal category

S4B.

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# Psychiatrists: Background, Career and Career Alternatives of a Group of Recently Appointed Consultants\*

By PETER BROOK

This paper reports the finding of one section of the third of a series of surveys on the training and background of a group of recently appointed consultant psychiatrists. The original survey was a postal enquiry primarily concerned with training, which was circulated to every consultant psychiatrist in the United Kingdom who had been appointed to a post in general psychiatry, with at least 6 N.H.S. sessions, between 1 October 1963 and 30 September 1966 (Royal Medico-Psychological Association, 1969). The second survey, using a different form of questionnaire, and enquiring more closely into background and motives for going into the specialty, was circulated to consultants appointed between the 1 October 1966 and 30 September 1969 (Brook, 1972; Brook, 1973).

## METHOD

The present survey, using an almost identical questionnaire to the immediately preceding one, was sent to consultants appointed between 1 October 1969 and 30 September 1972, using the same criteria of eligibility as for the first and second surveys. Accompanying the questionnaire was a pro forma which recipients who did not consider themselves as fulfilling the criteria of eligibility were asked to return, indicating on it why they did not fall within the scope of the survey. Replies were received from 125 out of 135 eligible, that is a 92.6 per cent response rate.

## RESULTS

The responses were analysed first by dividing the respondents into three groups, based on the type of hospital in which they had spent the

majority of their time in the registrar grade. These groups were:

- Psychiatric Hospitals and Units ('P');
- Teaching Hospitals and University Departments ('T');
- Bethlem Royal and Maudsley Hospitals ('M').

TABLE I

*Type of hospital where majority of training received*  
*Percentages*

|                                      | 1963<br>group | 1966<br>group | 1969<br>group |
|--------------------------------------|---------------|---------------|---------------|
| Bethlem-Maudsley ..                  | 14            | 11            | 11            |
| Teaching and University hospitals .. | 28            | 26            | 31            |
| Psychiatric hospitals and units ..   | 57            | 60            | 56            |
| Armed Forces ..                      | 1             | 3             | 2             |
| Totals (= 100%) ..                   | 148           | 108           | 125           |

The respondents were then analysed by dividing them into four groups by the grade from which they had been appointed to consultant. These groups were:

- Senior registrar ('S.R.');
- Medical assistant and senior hospital medical officer ('M.A.');
- Research and academic ('R.A.');
- Other: for example consultant, either locum or outside the U.K., armed forces, registrar, prison medical service ('other').

Consultants answering the original questionnaire will hereafter be referred to as the 1963 group, those responding to the second questionnaire the 1966 group, and to the third the 1969 group.

Table I shows that there has been a slight increase only in recent years in the output of consultants from teaching and university hospi-

\* This study was funded by a grant from the Department of Health and Social Security.

TABLE II  
*Grade held on appointment as consultant*  
*Percentages*

|                                                          | 1963 | 1966 | 1969 |
|----------------------------------------------------------|------|------|------|
| Senior Registrar ..                                      | 54   | 60   | 62   |
| Senior Hospital Medical Officer and Medical Assistant .. | 32   | 18   | 10   |
| Research and Academic ..                                 | 8    | 16   | 16   |
| Other grades ..                                          | 6    | 6    | 12   |
| Totals (= 100%) ..                                       | 148  | 108  | 125  |

tals, despite their recent expansion in junior staff (Robin, 1969; Brook and Letemendia, 1971). Future surveys are certain, however, to show that more consultants will have done more of their training in teaching hospital settings as more of their increased establishment of junior staff progress through the training grades. Comparing the three groups of consultants (Table II), it will be seen that there has been a sharp fall in recent years in the number of consultants appointed from the Senior Hospital Medical Officer (S.H.M.O.) and Medical Assistant grades. In the original survey 47 were promoted from the former grade and only 1 from the latter. In the present one, 8 consultants had been Medical Assistants immediately prior to their appointment and 5 had been S.H.M.O's. This reflects the dwindling numbers of S.H.M.O's; at the same time the Medical Assistant grade does not seem to provide as ready an outlet as S.H.M.O's as, in the three

year period, only one in every 30 Medical Assistants in post obtained promotion to consultant. Comparing the 1963 and 1969 groups, the number of those promoted from the Research and Academic grades shows a very marked rise.

Table III demonstrates that the S.H.M.O's and Medical Assistants had more usually received their training in psychiatric hospitals.

#### *Country of birth and qualification*

In the past three years, as is demonstrated in Table IV, there has been a marked rise in the number of consultant psychiatrists born outside the British Isles, and an even sharper rise in those qualifying in other countries. One-eighth of the consultants appointed between 1969 and 1972 had graduated overseas, the largest single group having qualified in the Indian Sub-continent. These figures also give some indication as to how the Department of Health and Social Security's criterion of country of birth in classifying the origin of doctors relates to the criterion of country of qualification: this latter would seem to be a more meaningful way of classifying doctors for the purpose, say, of manpower estimations.

#### *Parental occupation*

Twenty-one per cent of the psychiatrists had a medical parent, which compares with 17 per cent of the 1961 final year students (Royal Commission Report, Appendix 19). Seventy-one per cent of the combined 1966 and 1969 survey

TABLE III  
*Type of hospital and grade from which respondents were promoted*  
*Percentages*

|                                                             | Bethlem<br>Maudsley | Teaching<br>and<br>University<br>hospitals | Psychiatric<br>hospitals<br>and<br>units | All<br>respondents<br>(inc. 2 armed<br>forces) |
|-------------------------------------------------------------|---------------------|--------------------------------------------|------------------------------------------|------------------------------------------------|
| Senior Registrar .. ..                                      | 79                  | 64                                         | 57                                       | 62                                             |
| Senior Hospital Medical Officer and Medical Assistant .. .. |                     | 5                                          | 16                                       | 10                                             |
| Research and Academic .. ..                                 | 21                  | 21                                         | 13                                       | 16                                             |
| Others .. ..                                                |                     | 10                                         | 14                                       | 12                                             |
| Totals (= 100%) .. ..                                       | 14                  | 39                                         | 70                                       | 125                                            |

groups had fathers from socio-economic groups 1 and 2 (1961 final year students—69 per cent).

#### *Participation in college life*

Psychiatrists, at least by their own recollection, seem to have been more active than other students in all forms of activities, particularly cultural, while they were medical students, using the 1961 final year students as a basis for comparison.

#### *Stage when decision was made to enter psychiatry*

Overall, 30 per cent of the 1966 and 1969 consultant groups recorded that they had made the decision to enter psychiatry before qualifying, a figure which matches closely to Last and

Stanley's findings from their survey of recently qualified doctors (Last and Stanley, 1968).

There is a marked contrast between the Maudsley and the Psychiatric hospital group, a much higher proportion of the former making a choice before going into psychiatry and conversely many fewer making this decision after having been in the specialty. This might perhaps mean that more of the Maudsley graduates have more definite career plans, while more of the Psychiatric Hospital graduates drift into psychiatry by accident.

#### *Career choice determinants*

Some of the factors which influenced the consultants in making their choice to go into

TABLE IV  
*Countries of birth and qualification*

|      |              |  | Ireland<br>(Republic) | Indian<br>sub-<br>continent | Europe | Old<br>Common-<br>wealth | Africa | Other<br>countries | Total<br>outside<br>British<br>Isles |
|------|--------------|--|-----------------------|-----------------------------|--------|--------------------------|--------|--------------------|--------------------------------------|
| 1966 | Born ..      |  | 1                     | 4                           | 3      | 1                        | 1      | 3                  | 12                                   |
| 1966 | Qualified .. |  | 1                     | 2                           |        | 1                        |        | 1                  | 4                                    |
| 1969 | Born ..      |  | 6                     | 12                          | 7      | 6                        | 1      | 2                  | 28                                   |
| 1969 | Qualified .. |  | 7                     | 7                           | 2      | 4                        | 1      | 1                  | 15                                   |

TABLE V  
*Stage at which decision to enter psychiatry was made*  
*Percentages*

|                             |  | Bethlem<br>Maudsley<br>1966 and<br>1969 | Teaching<br>and<br>University<br>1966 and<br>1969 | Psychiatric<br>hospitals<br>and units<br>1966 and<br>1969 | All<br>1966 | All<br>1969 | Combined<br>1966 and<br>1969 |
|-----------------------------|--|-----------------------------------------|---------------------------------------------------|-----------------------------------------------------------|-------------|-------------|------------------------------|
| Medical students ..         |  | 31                                      | 33                                                | 27                                                        | 31          | 29          | 30                           |
| After qualifying ..         |  | 54                                      | 39                                                | 30                                                        | 30          | 40          | 35                           |
| First year in psychiatry .. |  | 12                                      | 18                                                | 31                                                        | 30          | 22          | 25                           |
| After first year ..         |  | 4                                       | 10                                                | 10                                                        | 8           | 9           | 9                            |
| Cannot say ..               |  |                                         |                                                   | 2                                                         | 1           | 1           | 1                            |
| Totals (= 100%) ..          |  | 26                                      | 67                                                | 135                                                       | 108         | 125         | 233                          |

(5 armed forces in totals only).



# 4 PSYCHIATRISTS: BACKGROUND, CAREER, CAREER ALTERNATIVES OF A GROUP OF CONSULTANTS

the specialty, together with the degree of importance which they attached to these factors, in shown in Table VI.

Between the Teaching, Maudsley and Psychiatric Hospital groups there was little difference, except that curiosity seemed to have been a

TABLE VI  
Career choice determinants  
Percentages  
(n = 125)

|                                                                                                                                                        | Very important | Quite important | Of secondary importance | Irrelevant or unimportant | 1966 consultants (very important only) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|-------------------------|---------------------------|----------------------------------------|
| 1. Because you felt that psychiatry was an important and interesting branch of medicine . . . .                                                        | 58             | 28              | 7                       | 6                         | 57                                     |
| 2. Because of a curiosity about or interest in other people, their emotions and reasons for their actions . . . . .                                    | 39             | 39              | 10                      | 11                        | 48                                     |
| 3. Because of an interest aroused by undergraduate teaching . . . .                                                                                    | 22             | 24              | 14                      | 39                        | 14                                     |
| 4. Because of an interest aroused by psychiatrist with whom you came into contact after you qualified, but before you went into psychiatry . . . . .   | 14             | 20              | 10                      | 58                        | 13                                     |
| 5. Because you wanted to learn some psychiatry to broaden your medical experience . . . .                                                              | 11             | 29              | 25                      | 35                        | 12                                     |
| 6. Because of an interest in the workings of communities and institutions, particularly their effect on people . . . . .                               | 7              | 23              | 26                      | 44                        | 9                                      |
| 7. Because of opportunities for research . . . . .                                                                                                     | 6              | 17              | 26                      | 51                        | 5                                      |
| 8. Because you felt that promotion prospects were better in psychiatry than in other specialties . .                                                   | 6              | 13              | 20                      | 61                        | 5                                      |
| 9. A member of your family or a friend had suffered from mental illness . . . . .                                                                      | 4              | 7               | 2                       | 86                        | 5                                      |
| 10. By accident (e.g. only post available) . . . . .                                                                                                   | 4              | 5               | 7                       | 84                        | 4                                      |
| 11. Because you felt that a knowledge of psychiatry would enable you to become a better adjusted person . . . . .                                      | 3              | 14              | 27                      | 56                        | 3                                      |
| 12. Because psychiatry was a specialty compatible with family life because of less likelihood of long and irregular hours and disturbed nights . . . . | 3              | 14              | 23                      | 59                        | 3                                      |
| 13. A member of your family or a friend was working in the psychiatric field . . . . .                                                                 | 2              | 6               | 6                       | 86                        | 0                                      |
| 14. Because of an antipathy to other branches of medicine . . . .                                                                                      | 1              | 10              | 17                      | 73                        | 0                                      |

little more important to the Maudsley graduates, and arousal of interest by a psychiatrist with whom they had come into contact with after qualification was markedly more important for this group. It would seem that psychiatrists as a whole do not, at least consciously, go into psychiatry to solve their own emotional problems or because of an antipathy to other branches of medicine. What is perhaps the most striking finding is that two-fifths recall that their undergraduate teaching was unimportant or irrelevant in influencing their choice of psychiatry as a career. This finding ought to arouse deep concern amongst psychiatrists working in Teaching Hospitals. It could partly be a reflection on the way that the subject is taught, and partly, and perhaps most importantly, a result of the poor level of staffing found in the psychiatric departments of Teaching and University Hospitals (Carstairs, Walton, Smythies and Crisp, 1968).

#### *Age of entry into psychiatry and appointment as consultant*

On average psychiatrists go into the specialty four years after qualification, and emerge as consultants at the age of 37 after not quite 9 years of training (Table VII). However, this overall figure conceals important differences between psychiatrists who have trained at

different types of hospitals and who have gone up different promotion ladders. Senior Registrars took the shortest time to become consultants, while the Medical Assistant and S.H.M.O. group took the longest. Surprisingly the Research and Academic group are younger as a whole on appointment than any others, partly because they go in at a younger age and partly because they take very little more time once in the specialty to become consultants than the senior registrar group. Psychiatrists trained at the Maudsley take the least time to become consultants, although because they go into psychiatry after a longer interval from qualification than the Teaching Hospital group, they are, on average, a little older. Comparing the Psychiatric Hospital and Teaching Hospital groups, the former go in later and take longer to become consultants, and in consequence are some  $3\frac{1}{2}$  years older than their teaching hospital counterparts.

#### *Alternative career choices*

Each consultant was asked the following questions:

'If you had failed in what you would have considered a reasonable time to obtain a consultant post in general psychiatry, would you:

- (a) Have remained in a permanent non-consultant post in general psychiatry?

TABLE VII  
*Age of entry into psychiatry and on appointment as Consultant by hospital type and promotion grade  
(2 armed forces excluded)*

|                                      | Years                            |                                                             |                                                 |                                                                          |
|--------------------------------------|----------------------------------|-------------------------------------------------------------|-------------------------------------------------|--------------------------------------------------------------------------|
|                                      | Mean age when entered psychiatry | Mean interval between qualification and entering psychiatry | Mean age when appointed Consultant Psychiatrist | Mean interval between entering psychiatry and appointment as Consultants |
| All respondents ..                   | 28.3                             | 4.0                                                         | 37.2                                            | 8.9                                                                      |
| Senior Registrars ..                 | 29.2                             | 4.4                                                         | 36.7                                            | 7.5                                                                      |
| Research and academic ..             | 26.8                             | 3.2                                                         | 34.7                                            | 7.9                                                                      |
| Other .. .. .                        | 28.1                             | 3.5                                                         | 39.4                                            | 11.3                                                                     |
| Medical Assistant and S.H.M.O. .. .. | 28.1                             | 3.1                                                         | 40.5                                            | 12.4                                                                     |
| Psychiatric hospital ..              | 29.3                             | 4.5                                                         | 38.6                                            | 9.3                                                                      |
| Teaching hospital ..                 | 27.3                             | 2.9                                                         | 35.3                                            | 8.0                                                                      |
| Maudsley .. ..                       | 29.8                             | 5.1                                                         | 37.4                                            | 7.6                                                                      |

- (b) Switched to child psychiatry?
- (c) Switched to subnormality?
- (d) Switched to forensic psychiatry?
- (e) Switched to psychogeriatrics?
- (f) Switched to another specialty?
- (g) Gone into general practice?
- (h) Emigrated permanently?

To each question the consultant was allowed one of the following three responses: Probably; Possibly; Definitely No.

Table VIII compares the responses of the 1966 and 1969 group. Table IX analyses responses by the appointment grade and Table X by the hospital type. The single, most striking finding, in both 1969 and 1966 groups, was that nearly one third would probably have emigrated if they had failed to obtain a consultant post and another third had considered this as a possibility. The next most frequently given alternative was that nearly one-fifth would have remained in a permanent non-consultant post and another quarter would have regarded this as possible. The next choice in order, at least for those answering probably, was switching to general practice; over half would have regarded this as either a probable or a possible alternative. The numbers who would probably have transferred to one of the psychiatric specialties was small, and moving to another branch of medicine outside psychiatry was mentioned more frequently than going into either forensic psychiatry or subnormality.

Comparing the 1966 and 1969 groups there are no major changes, although psychogeriatrics would seem to have become rather more popular and emigration rather less so. There may have been some hardening in attitude against switching to forensic psychiatry and some increasing willingness to consider the possibility of going into general practice.

Comparing the four appointment grades, it will be seen that there is a very clear distinction in the attitude to going into a permanent non-consultant grade between those already in such a post and the senior registrar group. This would have been expected, but what is perhaps surprising is that a quarter of the research and academic group would probably have settled in a non-consultant grade, although the phrasing of the question did not exclude the possibility of such a post in an academic setting. Conversely, it was the senior registrar group who would most probably have emigrated and a third of these indicated that this would have been their choice, while this was the least popular alternative with the research and academic group. A substantial proportion, 12 per cent of the senior registrar group would probably have switched to psychogeriatrics, although slightly more would have considered going into general practice.

When comparisons are made between the three hospital groups, perhaps the most striking finding is that those who trained in Psychiatric

TABLE VIII  
*Expressed preference for career alternatives to a Consultant post in general psychiatry*  
Percentages\*

|                                             | Probably |      | Possibly |      | Definitely no |      |
|---------------------------------------------|----------|------|----------|------|---------------|------|
|                                             | 1966     | 1969 | 1966     | 1969 | 1966          | 1969 |
| Remained in a permanent non-consultant post |          |      |          |      |               |      |
| in general psychiatry .. .. .               | 19       | 18   | 28       | 26   | 53            | 57   |
| Switched to child psychiatry .. .. .        | 6        | 6    | 38       | 41   | 56            | 53   |
| Switched to subnormality .. .. .            |          | 4    | 19       | 20   | 82            | 76   |
| Switched to forensic psychiatry .. .. .     | 9        | 5    | 38       | 29   | 53            | 66   |
| Switched to psychogeriatrics .. .. .        | 5        | 10   | 26       | 21   | 69            | 69   |
| Switched to another specialty .. .. .       | 6        | 6    | 21       | 19   | 73            | 75   |
| Gone into general practice .. .. .          | 8        | 14   | 35       | 42   | 57            | 45   |
| Emigrated permanently .. .. .               | 39       | 30   | 32       | 35   | 29            | 35   |

\* Number of respondents was 108 in 1966, 125 in 1969.

TABLE IX

*Expressed preference for career alternatives to a Consultant post in general psychiatry  
By appointment grade*

(Figures in brackets are percentages)

|                                                                         | Probably   |           |           |           | Possibly   |           |            |           | Definitely no |            |            |            |
|-------------------------------------------------------------------------|------------|-----------|-----------|-----------|------------|-----------|------------|-----------|---------------|------------|------------|------------|
|                                                                         | SR         | MA        | RA        | Other     | SR         | MA        | RA         | Other     | SR            | MA         | RA         | Other      |
| Remained in a permanent non-consultant post in general psychiatry .. .. | 7<br>(9)   | 5<br>(38) | 5<br>(25) | 3<br>(20) | 20<br>(26) | 5<br>(38) | 6<br>(30)  | 7<br>(47) | 50<br>(65)    | 3<br>(23)  | 9<br>(43)  | 5<br>(33)  |
| Switched to child psychiatry .. ..                                      | 7<br>(9)   | —         | —         | 1<br>(7)  | 32<br>(42) | 6<br>(46) | 7<br>(35)  | 6<br>(40) | 38<br>(50)    | 7<br>(54)  | 13<br>(63) | 8<br>(53)  |
| Switched to subnormality .. ..                                          | 4<br>(5)   | —         | 1<br>(5)  | —         | 11<br>(14) | 3<br>(23) | 3<br>(15)  | 5<br>(33) | 62<br>(81)    | 10<br>(77) | 16<br>(80) | 10<br>(67) |
| Switched to forensic psychiatry .. ..                                   | 4<br>(5)   | —         | 1<br>(5)  | 1<br>(7)  | 32<br>(42) | 4<br>(31) | 10<br>(50) | 5<br>(33) | 41<br>(53)    | 9<br>(70)  | 11<br>(55) | 9<br>(60)  |
| Switched to psychogeriatrics .. ..                                      | 9<br>(12)  | 1<br>(8)  | 1<br>(5)  | 1<br>(7)  | 23<br>(30) | 4<br>(31) | 3<br>(15)  | 6<br>(40) | 45<br>(58)    | 8<br>(62)  | 13<br>(65) | 7<br>(47)  |
| Switched to another specialty .. ..                                     | 3<br>(4)   | —         | 4<br>(20) | —         | 11<br>(14) | 2<br>(15) | 8<br>(40)  | 2<br>(13) | 63<br>(82)    | 11<br>(85) | 8<br>(40)  | 13<br>(87) |
| Gone into general practice .. ..                                        | 10<br>(13) | 2<br>(15) | 3<br>(15) | 2<br>(13) | 34<br>(44) | 3<br>(23) | 9<br>(45)  | 3<br>(20) | 33<br>(43)    | 8<br>(62)  | 18<br>(90) | 10<br>(67) |
| Emigrated permanently .. ..                                             | 26<br>(32) | 3<br>(23) | 4<br>(20) | 4<br>(26) | 28<br>(38) | 4<br>(31) | 10<br>(50) | 2<br>(13) | 23<br>(30)    | 6<br>(46)  | 6<br>(30)  | 9<br>(60)  |

SR = Senior Registrar (N = 77)  
RA = Research or Academic (N = 20)

MA = S.M.H.O. and Medical Assistant (N = 13)  
Other—Other grades (N = 15)

Hospitals and Units were most prepared to remain in the permanent non-consultant grade, while those from the Maudsley were least so, with Teaching Hospital graduates intermediate. Another interesting difference is that just over two-thirds of the Teaching Hospital group would at least have entertained the possibility of switching over to general practice as compared with just over a third of the Maudsley graduates and just over half of the psychiatric hospital trainees.

#### DISCUSSION

The grouping made according to the type of hospital where the consultants had received the majority of their training reveals clear cut

differences between consultants both in background and in career. Crude composite pictures might be drawn thus:

The Maudsley graduates (overwhelmingly the product of middle-class homes) enter psychiatry relatively late but apparently with more clear-cut plans: they go through the training grades more quickly than average and are appointed consultant either from a senior registrar post or while in a research and academic post; they are more likely to contemplate permanent emigration if they fail to achieve the objective of a consultant post than other psychiatrists. The Teaching Hospital group spend considerably less time in other specialties before entering psychiatry, take a little longer than the Maudsley

TABLE X  
*Expressed preference for career alternatives to a Consultant post in general psychiatry*  
*By hospital type*  
 (figures in brackets are percentages)

|                                                                         | Probably  |            |            | Possibly  |            |            | Definitely no |            |            |
|-------------------------------------------------------------------------|-----------|------------|------------|-----------|------------|------------|---------------|------------|------------|
|                                                                         | M         | T          | P          | M         | T          | P          | M             | T          | P          |
| Remained in a permanent non-consultant post in general psychiatry .. .. | —         | 5<br>(13)  | 16<br>(23) | 4<br>(29) | 9<br>(23)  | 18<br>(26) | 10<br>(71)    | 25<br>(64) | 36<br>(51) |
| Switched to child psychiatry .. ..                                      | 1<br>(7)  | 2<br>(5)   | 5<br>(7)   | 3<br>(21) | 14<br>(36) | 32<br>(46) | 10<br>(71)    | 23<br>(59) | 33<br>(47) |
| Switched to subnormality .. ..                                          | 1<br>(7)  | 1<br>(2)   | 3<br>(4)   | 2<br>(14) | 7<br>(18)  | 15<br>(21) | 11<br>(79)    | 31<br>(80) | 52<br>(74) |
| Switched to forensic psychiatry .. ..                                   | —         | 2<br>(5)   | 3<br>(4)   | 6<br>(43) | 16<br>(41) | 25<br>(36) | 8<br>(57)     | 21<br>(54) | 42<br>(60) |
| Switched to psychogeriatrics .. ..                                      | 1<br>(7)  | 4<br>(10)  | 7<br>(10)  | 3<br>(21) | 9<br>(23)  | 26<br>(37) | 10<br>(71)    | 26<br>(67) | 35<br>(50) |
| Switched to another specialty .. ..                                     | —         | 4<br>(10)  | 3<br>(4)   | 3<br>(21) | 12<br>(13) | 8<br>(11)  | 11<br>(79)    | 23<br>(59) | 59<br>(84) |
| Gone into general practice .. ..                                        | 1<br>(7)  | 6<br>(15)  | 10<br>(14) | 4<br>(29) | 21<br>(54) | 27<br>(39) | 9<br>(64)     | 12<br>(31) | 33<br>(47) |
| Emigrated permanently .. ..                                             | 5<br>(36) | 13<br>(33) | 19<br>(27) | 5<br>(36) | 16<br>(41) | 23<br>(33) | 4<br>(29)     | 10<br>(26) | 28<br>(40) |

M = Maudsley trained (N = 14)

T = Teaching Hospital trained (N = 39)

P = Psychiatric Hospital trained (N = 70)

(N.B.: Discrepancy in 'Switched to psychogeriatrics' column due to 2 non-applicable replies).

group to go through the grades and typically are appointed as consultants from senior registrar in their mid-thirties.

The Psychiatric Hospital group contains the largest number of overseas graduates: members of this group go into psychiatry later than those from Teaching Hospitals and often opt for a career in psychiatry only after a period of time in the specialty; this might imply, whatever their stated recollection, that many drift into their permanent career by accident. They are longer in junior grades before being appointed consultants, and they are older on average than the other two groups. Another paper will examine the training these consultants have received: again there are clear differences between the three groups, the Maudsley graduates reporting the best training, the Psychiatric Hospital group the least satisfactory, with the Teaching hospital group intermediate (Brook, 1974).

Perhaps the most important finding in the present survey is the attitude of consultants to career alternatives if they had failed to secure

any consultant post in what they considered to be a reasonable time. It is clear that the idea of switching to one of the specialties within psychiatry, which is regarded by the Department of Health and Social Security as one way of overcoming the promotion bottle-neck (Kilgour, 1970), is no more popular now than it was three years ago. It is not likely to become more popular until academic departments in the specialties are greatly strengthened and until training in these specialties is improved (Brook, 1973). If subnormality in particular fails to recruit psychiatrists then other alternatives may be considered. An editorial in the *British Medical Journal* (1973) left unanswered its own question: 'If medicine cannot fill the gap, should teachers, psychologists, and social workers be invited to do so?'

One last disquieting fact must be underlined, and that is the large number of trainees, many of whom have received the best training, who seemingly would have been prepared to emigrate if they had failed to achieve their objective of a consultant post.



## SUMMARY

A postal survey of 125 recently-appointed consultants in general psychiatry revealed differences in background and career depending on which type of hospital they had received their psychiatric training in. The alternative of switching to one of the psychiatric specialties in order to achieve consultant status is far less popular than that of emigrating permanently.

## ACKNOWLEDGEMENTS

This research was carried out under the aegis of the Royal College of Psychiatrists and was financed by the Department of Health and Social Security. I am deeply grateful to all those consultants who completed the questionnaire. I acknowledge the help given by the Department, by Regional Hospital Boards, by the Welsh Office and the Scottish Home and Health Department in providing me with lists of questionnaires.

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## Emotional Illness in Psychiatric Trainees

By E. M. WARING

Emotional illness in psychiatric post-graduate trainees has been the topic of several papers in recent years (1, 2, 3). In summary, these papers suggest that emotional illness in psychiatric training is common. Anxiety and depression characterize these illnesses and occur most frequently in the first year of training. But, as Halleck and Woods have stated, 'Information as to the prevalence of anxiety states, depression, suicide, psychoses or serious acting out is unavailable' (4).

This study was designed to answer objectively five questions arising from the literature: 1. Does emotional illness occur in psychiatric trainees or is the literature due to observer bias? (e.g. trainees' supervisors describing normal emotional responses to training in terms of psychopathology.) 2. What is the prevalence, if any, of emotional illness in psychiatric trainees? 3. Is emotional illness commoner in psychiatric post-graduates than in other medical post-graduates? 4. Is prevalence higher in foreign medical school graduates? 5. Is prevalence higher in the first year of training?

### METHOD

The General Health Questionnaire (GHQ) is a 60-item, self-administered schedule designed as a reliable, valid and sensitive screening schedule for detecting non-psychotic emotional illness in general practice (5). The GHQ and a rating sheet (e.g. information about respondents' age, sex, marital status, etc.), were sent to 104 psychiatric trainees affiliated with the Institute of Psychiatry of the University of London and to a control group of 46 post-graduate registrars attached to King's College Hospital. All non-respondents received the GHQ by post a second time one month later. Respondents were informed that the study was of emotional factors and their role in training.

### RESULTS

The 104 psychiatric trainees consisted of 50 Registrars (predominantly U.K. born and trained with more than one year of training), 44 Clinical

Assistants (predominantly foreign medical school graduates) and 10 House Officers (predominantly U.K. born and in their first year of training). Four trainees left the Institute during the course of the study and were not included in the analysis. Of the remaining 100 trainees 87 returned the questionnaire. However, four responses were incomplete. Thus, 83 responses were finally analysed (40 Registrars, 33 Clinical Assistants and 10 House Officers).

Of the non-psychiatric medical post-graduates (N=46), two had left King's during the course of the study, and 35 out of 44 returned the GHQ, a response rate of 79 per cent.

Eighteen of 83 (22 per cent) psychiatric trainees had a score of 12 or greater on the GHQ as compared to one out of 35 (3 per cent) of the control group. A score of 12 or greater is suggestive of a high probability of non-psychotic emotional illness (5). Mean total symptom scores were significantly higher in the psychiatric training group (6.68 *vs.* 2.37,  $p < .001$ ). (Tables and statistical analysis available on request.)

The Registrars had a higher proportion of cases, 11 out of 40 (27.5 per cent) as compared to the House Officers, one out of 10 (10 per cent). The Registrars had a statistically significant higher mean total symptom score than the House Officers (8.63 *vs.* 2.0,  $p < .01$ ).

It was predicted that the Clinical Assistants would have a higher proportion of cases than the Registrars. This assumption was based on postulated increased stress of moving and acculturation. In fact, the proportion of cases was in the opposite direction with the Registrars higher, 11 out of 40 (27.5 per cent) and the Clinical Assistants, 7 out of 35 (21.2 per cent). This difference was not significant.

Finally, non-responders were found not to differ in age and sex distribution from those who returned their questionnaires.

In summary, 22 per cent of the psychiatric trainees had a score in the range of a probable case of non-psychotic emotional illness as compared to 3 per cent of non-psychiatric medical post-graduates. The prevalence was not higher in trainees in the first year of training or in foreign medical graduates as compared with U.K. born and trained post-graduates.

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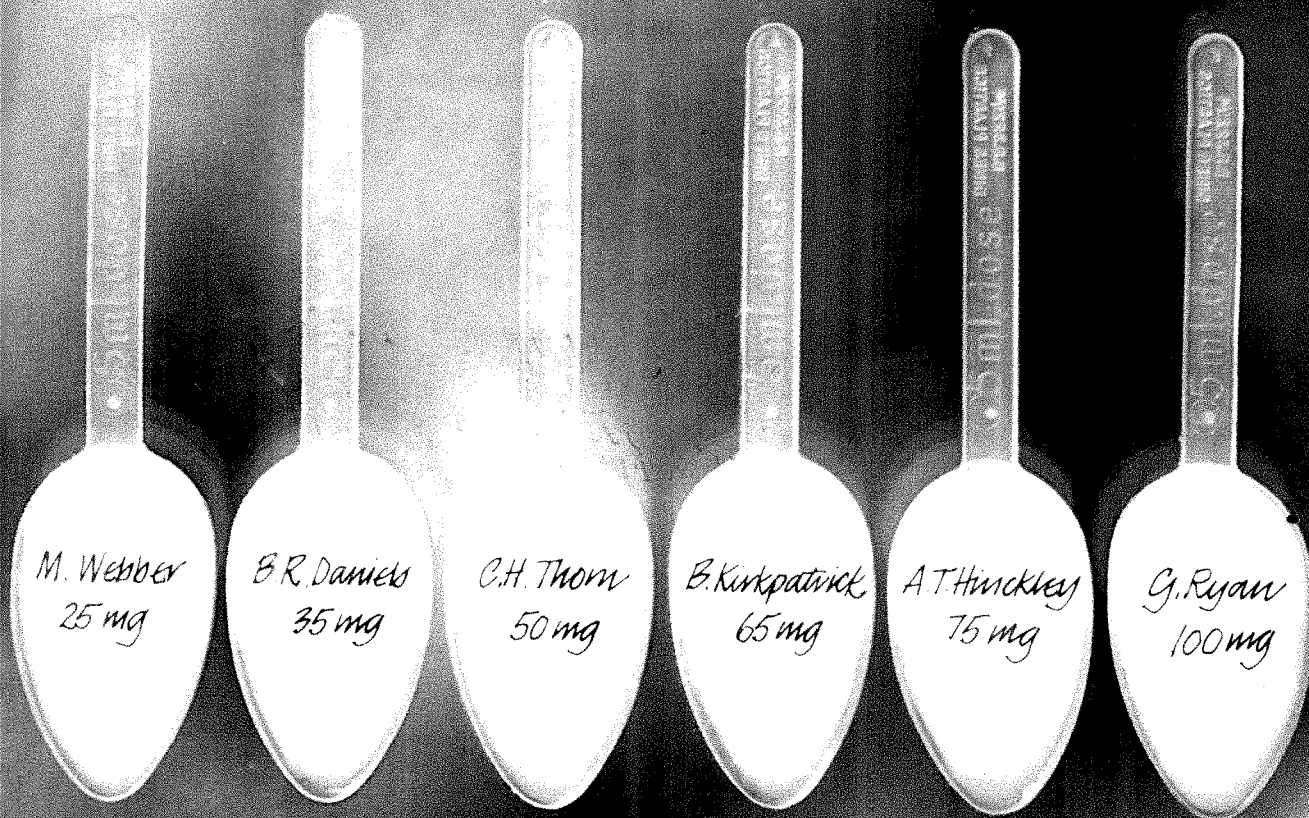
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1. Psychosomatics, 14, 42, 1973. "Melleril" is a Trade Mark. The two available strengths of Melleril Suspension are 100mg thioridazine base in 5ml and 25mg in 5ml.

## DISCUSSION

Several factors have been implicated in the aetiology of emotional illness in psychiatric trainees. Several authors suggest that the major factor is 'the personality that the student brings with him into training' (6, 7). Halleck and Woods state 'Many psychiatrists have the subjective impression that the choice of psychiatric specialization may also be determined by the presence of significant emotional conflict' (4). Factors present in all post-graduate medical training, such as prolonged dependency, hostility engendered by competition and relative socio-economic difficulties in comparison to non-training peers have also been implicated (4, 7). Finally, potentially pathogenic factors specific to psychiatric training include: 1. Identification with the psychopathology of one's patients. 2. The impact of psychotherapy supervision with development of 'psychological-mindedness'. 3. A shift from the authoritarian medical model to the non-authoritarian psychological approach and interdisciplinary team approach of clinical psychiatry (4).

The significance of emotional illness in psychiatric trainees to their training, careers and personal health remains problematic. Some authors suggest that the presence of anxiety and depression are necessary for the development of a competent and empathetic psychiatrist (8). Others suggest that anxiety and depression are symptoms of psychiatric illness which may be related to premature termination of training, poor training performance and cynical and negativistic attitudes to psychiatric practice (1).

Finally, these illnesses may be related to the high incidence of suicide, drug addiction and mental illness in physicians and psychiatrists in middle life (6). This study in no way resolves these issues but does suggest a methodology for exploring the training success, career adjustment and personal health of the probable cases in comparison to the controls in a prospective study. Further research to assess the role of aetiological factors in the development of illness and its significance to training and the future health of psychiatrists seems indicated.

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## School Performance of Adult Schizophrenics, Their Siblings and Age Mates

By D. R. OFFORD\*

In a previous paper, a preliminary report (Offord and Cross, 1971) found that adult schizophrenics differed in their school performance from both their siblings and their age mates. For instance, the pre-schizophrenics were significantly more likely than their siblings to have repeated at least one grade in elementary school and to have scored significantly lower on childhood IQ tests than their siblings and age mates.

Earlier studies (Wittman and Steinberg, 1944; Friedlander, 1945; Frazee, 1953; Robins, 1966) have noted that a substantial proportion of pre-schizophrenics who attended child guidance clinics had experienced serious academic difficulty in elementary school. Lane and her co-workers, in an extensive series of studies summarized in 1970 (Lane and Albee, 1970), noted, however, that the only consistent finding concerning the childhood IQs of pre-schizophrenics was that across social classes they scored lower on childhood IQ tests than their siblings. In addition, there was evidence that this result applied only to process and not to reactive schizophrenics (Heath *et al.*, 1965). Pollack *et al.* (1970) also found that schizophrenics-to-be scored lower on IQ tests in childhood than their siblings, but noted in addition that this was equally characteristic of children who as adults will be diagnosed as personality disorders.

The present paper reports the school record data on our complete sample of pre-schizophrenics, their siblings and age mates.

### METHOD

The patient pool was formed by all white patients born after 1920 admitted to a state hospital in Pennsylvania before 31 December

1970 with a diagnosis of schizophrenia. Schizophrenics with a secondary diagnosis of mild or moderate retardation were included, but schizophrenics with other secondary diagnoses such as alcoholism, epilepsy, chronic brain syndrome and all other mixed diagnoses were excluded.

To be included as a proband, the patient had to: (1) have been diagnosed as schizophrenic in adulthood before the age of 45 with nothing in his record to suggest that he could have been diagnosed as psychotic in childhood; (2) have attended school in the urban school system near the state hospital; and (3) have had sufficiently complete school records to determine with certainty whether or not he entered 7th grade\* with his age mates in regular class and to contain at least one determination of IQ during his school career.

One hundred and sixteen patients, 51 men and 65 women met the criteria for inclusion in the study. Each proband was matched with at least one control of the same race, sex, age and social class of origin (Hollingshead, 1957) who had attended the same school system and whose records also contained at least one IQ score and permitted a clear determination as to whether or not he started junior high school in regular class with his age mates. Three matched controls instead of one were available for 19 of the male probands and 20 of the female probands. The records of all the probands' siblings who went to this school system were also obtained.

Information was derived from the school records of the probands, siblings and controls. For this report three selected school record variables were considered: (1) Repeating. A child was considered to be a repeater if he did not enter grade 7 in regular class with his age

\* This work was supported by NIMH Grant 1-RO1-MH18442-01.

\* A child typically enters school in grade 1 at age 6. In 7th grade, usually his seventh year in school, he is 12.

mates. The occurrence in the first seven grades of any social promotions, special class placements, or repeating a year would dictate that a child should be classified as a repeater. (2) IQ scores. In order to ensure maximal comparability, virtually all scores were converted to the standard score system (mean = 100, S.D. = 15). The standardized IQ test scores for each proband, sibling and control were averaged to obtain an individual childhood IQ score. (3) Last regular school grade completed.

### RESULTS

Table I summarizes the findings across families for repeating, IQ and last grade completed. Forty-one per cent of the male probands repeated compared to 25 per cent of the female probands ( $\chi^2 = 2.89$ , d.f. = 1,  $p < 0.10$ ). The male schizophrenics had a significantly lower IQ than the female schizophrenics ( $t = 3.11$ ,  $p < 0.01$ ) and completed significantly fewer grades in regular class ( $t = 3.27$ ,  $p < 0.01$ ).

As one would expect, although it is not shown in Table I, repeating was closely related both to IQ score and to last grade completed. For both male and female patients the repeaters compared to the non-repeaters had lower IQs and had completed fewer grades in school. All the levels of significance were at the  $p < 0.01$

level or greater except for the last grade completed for the repeating versus non-repeating female probands, where the significance level was  $p < 0.02$ . In addition, the repeating male schizophrenics' mean IQ of 73.2 was significantly lower than the repeating female schizophrenics' mean IQ of 88.5 ( $t = 3.32$ ,  $p < 0.01$ ); also, the male repeaters completed significantly fewer grades in regular class than the female repeaters ( $t = 3.30$ ,  $p < 0.01$ ).

Again referring to Table I, the male probands compared to their controls (first control only) tended to repeat more often ( $\chi^2 = 2.87$ , d.f. = 1,  $p < 0.10$ ), to have a significantly lower mean IQ ( $t = 4.00$ ,  $p < 0.001$ ) and to have completed significantly fewer grades in school ( $t = 4.74$ ,  $p < 0.001$ ). On the other hand, the female probands did not differ from their controls on repeating, IQ and last grade completed.

The female patients came from significantly poorer families than the male patients (5.3 vs. 4.7 on a seven point scale (Hollingshead, 1957),  $t = 2.18$ ,  $p < 0.05$ ) and the male repeaters from significantly poorer families than the male non-repeaters (5.2 vs. 4.3,  $t = 2.12$ ,  $p < 0.05$ ). The social class levels of the female repeaters (5.7) and the female non-repeaters (5.2) were not significantly different. The mean sibship

TABLE I  
*Repeating, IQ and last grade completed*

| Group                        | Repeating |             | IQ* |       |      | Last grade completed |      |      |
|------------------------------|-----------|-------------|-----|-------|------|----------------------|------|------|
|                              | N         | % repeating | N   | Mean  | S.D. | N                    | Mean | S.D. |
| <i>Male probands</i> .. ..   | 51        | 41          | 51  | 88.2  | 17.5 | 45                   | 8.2  | 3.6  |
| Their male siblings ..       | 50        | 34          | 44  | 95.9  | 17.9 | 46                   | 9.6  | 2.9  |
| Their female siblings ..     | 50        | 34          | 41  | 93.8  | 13.6 | 50                   | 8.3  | 3.8  |
| Their controls† ..           | 51        | 23          | 51  | 100.6 | 11.9 | 50                   | 11.0 | 2.2  |
| <i>Female probands</i> .. .. | 65        | 25          | 65  | 97.1  | 13.2 | 64                   | 10.1 | 2.6  |
| Their male siblings ..       | 84        | 25          | 65  | 96.3  | 12.4 | 77                   | 9.8  | 2.2  |
| Their female siblings ..     | 63        | 15          | 58  | 97.0  | 15.9 | 65                   | 9.9  | 2.4  |
| Their controls† ..           | 65        | 14          | 65  | 101.8 | 14.7 | 63                   | 10.7 | 2.1  |

\* Raw scores were used. The correlation between raw and standardized IQ scores was  $> 0.99$ . Although we have a test score, the name of the IQ test was not recorded for 3 patients, 21 siblings and 3 controls and thus these IQ scores could not be standardized. By using raw IQ scores, these persons were not lost from this aspect of the study.

† First control only.

size of the families of the male probands (3.7) was not significantly different from that of the female probands (4.0); however, overall, the families of the repeaters were larger than the families of the non-repeaters (5.0 vs. 3.5,  $t = 3.00$ ,  $p < 0.01$ ).

The 116 patients had 329 siblings. We located the school records for 248 siblings and found from hospital record data that an additional 18 had died before school age. Thus 248 of 311 siblings (80 per cent) attended the same school system as the probands and 63 (20 per cent) went to school elsewhere.

The within-family results reported in Table II, where a patient is compared only with his own siblings or with his own controls (1 or 3) by means of a modified version of the Wilcoxon matched-pairs signed-ranks test (Jones, 1971), provide the most meaningful comparisons in the school record data. Here it can be seen that the male patients repeated more often than their siblings, their sisters and their controls, but not more often than their brothers. The male patients had a significantly lower IQ than all their siblings, their brothers, their sisters and their controls. The results for last grade completed are in the same direction, but not as strong. Male patients completed significantly

fewer grades in school than all their siblings and their controls and tended to have completed fewer grades in school than their brothers and sisters considered separately.

The within-family comparison results for the female probands were strikingly different from those of the male patients. The female schizophrenics, with two exceptions, did not differ from all their siblings, their brothers and sisters considered separately, or their controls on repeating, IQ and last grade completed. The exceptions were that the female patients repeated significantly more often than their sisters and had significantly lower IQ scores than their controls.

Next, the within-family school record data were rostered by sex according to the mean IQ of the family (patient and his siblings) beginning with the lowest mean IQ and ending with the highest. Each roster was then divided in two with each cut-off point ensuring that approximately one half the families would be above it and one half below it. Following this, the same within-family analyses as reported in Table II were repeated on these new groupings: male patients with mean family IQs of 95 or less (27 cases); male patients with mean family IQs of greater than 95 (24 cases); female patients with

TABLE II  
*Within-family analysis for repeating, IQ, and last grade completed*

| Within-family comparisons | Repeating |                       | IQ* |       |                       | Last grade completed |       |                       |
|---------------------------|-----------|-----------------------|-----|-------|-----------------------|----------------------|-------|-----------------------|
|                           | N†        | Level of significance | N†  | T     | Level of significance | N†                   | T     | Level of significance |
| <i>Male patients</i>      |           |                       |     |       |                       |                      |       |                       |
| vs. all their siblings .. | 16        | $p < .01$             | 30  | 75    | $p < .002$            | 31                   | 137   | $p < .05$             |
| vs. their brothers ..     | 10        | n.s.                  | 25  | 68    | $p < .01$             | 22                   | 68    | $p < .10$             |
| vs. their sisters ..      | 10        | $p < .01$             | 19  | 22    | $p < .001$            | 21                   | 64    | $p < .10$             |
| vs. their controls ..     | 26        | $p < .005$            | 50  | 273   | $p < .001$            | 36                   | 48    | $p < .0001$           |
| <i>Female patients</i>    |           |                       |     |       |                       |                      |       |                       |
| vs. all their siblings .. | 19        | n.s.                  | 42  | 420   | n.s.                  | 37                   | 385   | n.s.                  |
| vs. their brothers ..     | 15        | n.s.                  | 32  | 272   | n.s.                  | 29                   | 191.5 | n.s.                  |
| vs. their sisters ..      | 12        | $p < .05$             | 27  | 167.5 | n.s.                  | 22                   | 118   | n.s.                  |
| vs. their controls ..     | 26        | n.s.                  | 65  | 761.5 | $p < .05$             | 49                   | 452   | n.s.                  |

\* Raw IQ scores.

† N refers to the number of comparisons available for the Wilcoxon test. Therefore, for instance, for the patient-sibling comparisons on repeating, families with no siblings or families where the proband and all his siblings either repeated or did not repeat (thus the sibship was tied) were excluded.

mean family IQs of 97 or less (32 cases); and female patients with mean family IQs of greater than 97 (33 cases). As can be seen from Table III, only in the male patients with mean family IQs of 95 or less did the within-family comparisons reported in Table II hold up consistently. For these low-IQ male sibships, 10 of the 12 results were statistically significant. In comparison, for the male probands with mean family IQs of greater than 95, only one statistically significant result was present. Similarly, for female probands with mean family IQs of 97 or less, two results reached significance, and for the higher IQ female sibships ( $>97$ ) none of the data was statistically significant. Thus, the within family differences occurring in the school record data applied almost exclusively to males who belonged to low-IQ sibships.

#### DISCUSSION

A striking feature of these results was the marked sex differences observed in the schizophrenic probands. For example, the male schizophrenics compared to the female schizophrenics had significantly lower childhood IQs, had

completed significantly fewer grades in regular class and tended to have repeated more often. The male schizophrenics differed significantly from the controls on all three variables, repeating, IQ and last grade completed while the female probands compared to their controls showed no significant differences on these same measures.

These results cannot be accounted for by the social class data. For example, the female schizophrenics came from significantly poorer rather than from richer families than the male schizophrenics. The data indicate that not only did the male probands repeat more often than the females, but that among those who repeated the boys compared to the girls had a significantly lower mean IQ and had completed significantly fewer grades in regular class. Indeed, 13 of the males, but only 5 of the females had IQs less than 80. Thus, in this sample, there was a group of low-IQ males (13 of 51) who received a diagnosis of schizophrenia in a state hospital setting. Low-IQ women were significantly less likely to be admitted to the state hospital with a schizo-

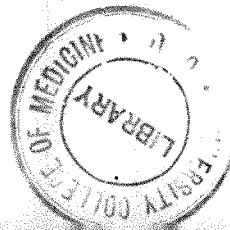
TABLE III

*Within-family analysis for repeating, IQ and last grade completed for sibships ordered by mean IQ of family\**

| Within-family comparisons for male patients |                |        |                            | Within-family comparisons for female patients |                |       |                            |
|---------------------------------------------|----------------|--------|----------------------------|-----------------------------------------------|----------------|-------|----------------------------|
| Mean IQ of family = 95 or < (n = 27)        |                |        |                            | Mean IQ of family = 97 or < (n = 32)          |                |       |                            |
|                                             | Repeat-<br>ing | IQ     | Last<br>grade<br>completed |                                               | Repeat-<br>ing | IQ    | Last<br>grade<br>completed |
| Pat. vs. siblings ..                        | <0.02†         | <0.002 | <0.01                      | Pat. vs. siblings ..                          | n.s.           | n.s.  | n.s.                       |
| Pat. vs. brothers ..                        | n.s.           | <0.05  | n.s.                       | Pat. vs. brothers ..                          | n.s.           | <0.05 | n.s.                       |
| Pat. vs. sisters ..                         | <0.01          | <0.01  | <0.05                      | Pat. vs. sisters ..                           | n.s.           | n.s.  | n.s.                       |
| Pat. vs. controls ..                        | <0.01          | <0.001 | <0.01                      | Pat. vs. controls ..                          | n.s.           | <0.02 | n.s.                       |
| Mean IQ of family = > 95 (n = 24)           |                |        |                            | Mean IQ of family = > 97 (n = 33)             |                |       |                            |
|                                             | Repeat-<br>ing | IQ     | Last<br>grade<br>completed |                                               | Repeat-<br>ing | IQ    | Last<br>grade<br>completed |
| Pat. vs. siblings ..                        | n.s.           | n.s.   | n.s.                       | Pat. vs. siblings ..                          | n.s.           | n.s.  | n.s.                       |
| Pat. vs. brothers ..                        | n.s.           | n.s.   | n.s.                       | Pat. vs. brothers ..                          | n.s.           | n.s.  | n.s.                       |
| Pat. vs. sisters ..                         | n.s.           | n.s.   | n.s.                       | Pat. vs. sisters ..                           | n.s.           | n.s.  | n.s.                       |
| Pat. vs. controls ..                        | n.s.           | n.s.   | <0.02                      | Pat. vs. controls ..                          | n.s.           | n.s.  | n.s.                       |

\* Mean IQ of family = Mean IQ of patient and siblings.

† Level of significance calculated from value of T.



phrenic diagnosis (5 of 65,  $\chi^2 = 5.61$ , d.f. = 1,  $p < 0.02$ ). One possible explanation for this result is that the low-IQ man compared to the low-IQ woman may be much more exposed to the outside world, for example, he will seek employment outside the home, and thus any behavioural disturbance he exhibits is less likely to be hidden and more likely to be brought to the attention of a doctor. The low-IQ woman on the other hand may show the same degree of disturbance, but because she remains in a sheltered environment, such as her home, she is never identified by mental health personnel as being disturbed and consequently is never admitted to a state hospital.

An alternative explanation is that low-IQ males compared to low-IQ females are more prone to schizophrenia. The mediating factor here may be central nervous system damage. For instance, Belmont *et al.* (1964), noted that schizophrenics with histories of early behavioural disturbance were predominantly male, had low IQs, and had impairments in perceptual functioning suggestive of CNS damage. Pollack *et al.* (1968), found that there were a subgroup of schizophrenic patients, predominantly male, with suspected minimal brain damage, and onset of psychosis in adolescence or early adulthood. Two further studies (Huffman and Wenig, 1954; Berry, 1967), the former providing no breakdown by sex and the latter dealing exclusively with males, observed that certain pre-schizophrenics had childhood symptoms suggestive of minimal brain damage. Thus evidence indicates that there are a group of men with low IQs and some evidence of CNS dysfunction who receive a diagnosis of schizophrenia. There appears to be no sizeable comparable group of women.

The within-family results indicated clearly that the pre-schizophrenic differed consistently on school performance from both his siblings and age mates only when the proband was a male who belonged to a low-IQ sibship (mean IQ 95 or less). When the present work is compared with other studies which have reported the IQs of schizophrenics-to-be and their siblings, certain sampling and methodological differences emerge.

Two studies of the Lane and Albee series

(Lane and Albee, 1965; Schaeffner *et al.*, 1967) concerned themselves specifically with proband-sibling IQ comparisons, and both found that the pre-schizophrenic had a significantly lower childhood IQ than his siblings. In these two studies, the siblings' IQs of a particular proband were averaged to give one combined sibling IQ score. In our work, however, by using a modified version of the Wilcoxon test (Jones, 1971), a within-family analysis was possible in which the proband's IQ score was given a rank within the sibship utilizing each reported sibling IQ score. In addition, in the first of these papers, and probably in both, preschizophrenics and their siblings who were in special class were excluded from the analysis. Thus, children with the lower IQs would not be included, although in an earlier study in this series (Lane and Albee, 1963) approximately one-third of the pre-schizophrenics were in special classes for dull children. In our work, all probands and siblings who attended the school system, whether or not in special class, were included. Lastly, in the earlier studies (Lane and Albee, 1965), there was no breakdown of the data by race (although approximately 40 per cent of the sample was Negro) and there were 'few' female probands and no detailed analysis by sex. In the later study (Schaeffner *et al.*, 1967) there was no reporting or analysis of the data by sex for either the schizophrenics-to-be or their siblings. In our present paper the within-family analyses are reported separately by sex of the proband and sex of the siblings.

The work of the Hillside Hospital group (Pollack *et al.*, 1970) also noted significantly lower childhood IQs for pre-schizophrenics compared with their siblings. However, these investigators compared the schizophrenic-to-be with his nearest-in-age normal sibling only. A normal sibling was one judged free of current symptomatology beyond a mild degree with no history of psychiatric treatment or impairment of function which would have warranted treatment. Here again, neither the proband nor sibling data were broken down by sex.

A weakness of all these studies which has been noted by Mednick and McNeil (1968) is that by the nature of the study designs the patient populations are non-mobile, since the

schizophrenics are admitted to mental hospitals in the same geographic areas where they attended school. In these papers, since the patient himself is non-mobile, his siblings on the average are more mobile than he is. Hence the possibility exists that the lower IQ score of the patient compared to his siblings is not related to the fact that the patient will be schizophrenic, but is related to the fact that the patient will be non-mobile. However, in our school record data, when the schizophrenic-to-be is compared with his non-mobile siblings only (Offord, 1973) the same significant results as reported in this paper are present. Thus mobility appears not to be a factor affecting the school performance of the proband versus his siblings. In addition, no significant within-family differences were found for number of moves per year of schooling, or for number of days absent per year. That is, there was no evidence that the proband averaged more moves during his school career than his siblings or age mates or was absent from school more than his brothers and sisters, or his age mates.

Thus when schizophrenics-to-be are compared on school performance with their brothers and sisters, where each sibling is considered separately using a within-family analysis, where children in special classes are not excluded from the sample, and where the data are broken down by sex, the pre-schizophrenic is found to have consistently poorer school performance than his siblings only when the proband is a male who belongs to a low-IQ sibship. Mobility, moves during the schooling years and school attendance do not account for these results.

How is one to explain them? If one centres on IQ, it becomes important to understand the relationship between IQ and schizophrenia. Two major possibilities exist. First, the schizophrenic process itself could lower IQ. That is, one of the prodromata of schizophrenia might be an interference with school performance and a lowering of IQ. A second possibility is that both the predisposition to schizophrenia and the IQ level are largely genetic but independently inherited traits. The evidence favours this latter interpretation (Jones, 1973). Here IQ can be viewed as a complication of the schizophrenic process, not unlike the role of

pregnancy and birth complications (Mednick, 1970). A high IQ can protect a predisposed person from becoming overtly schizophrenic, or if he does the disease may run a less malignant course (Offord and Cross, 1971; Jones, 1973), while a low IQ affords no such protection. This thesis explains why the pre-schizophrenic is most likely to have the lowest IQ in his family. Given a family predisposed to schizophrenia, the child with the lowest IQ will be the most vulnerable, or, if you like, will have the least protection against the illness, and will tend to show overt symptoms of the schizophrenic illness. In addition, one would expect that, given a family with a mild predisposition for schizophrenia, overt schizophrenia would only occur at all in a low-IQ sibship. It follows that in a high-IQ sibship with a schizophrenic proband the predisposition for schizophrenia must be quite severe. If it were not, no member of the sibship would show marked signs of the illness.

The problem still remains as to why in this study it is only within the low-IQ sibships and where the proband is a male that the pronounced proband-sibling school performance and IQ differences are found. Again, viewing schizophrenia and IQ as independently inherited traits, and following the reasoning presented above, one can surmise that in a low-IQ sibship the genes for low IQ predominate. The schizophrenic predisposition (primarily genetic) is slight, and here the IQ level, that is the potential protection against this handicap, becomes crucial. Thus, within these sibships the child with the lowest IQ is the one most likely to manifest the illness. In a high-IQ sibship, however, where the schizophrenic predisposition is greater, the importance of the IQ level becomes less. In these sibships the child who ends up with the highest genetic loading for schizophrenia cannot be protected readily by a high IQ because of the severity of the predisposition. In the high-IQ sibships, then, it is not necessarily the child with the lowest IQ who becomes schizophrenic. If one follows this hypothesis further, one would expect that in low-IQ sibships compared to high-IQ sibships, the diagnosis of schizophrenia in the proband would be less clear, since in a



way these patients could be expected to have 'less' schizophrenia. There is suggestive but not statistically significant evidence to support this. Using Birley and Brown's (1970) diagnostic classification of 'probable' and 'definite' schizophrenia, we found that 12 of the 51 male cases ended up in the 'probable' category, eight of these being probands belonging to a low-IQ sibship (IQ 95 or less) and the remaining four belonging to the higher-IQ sibships.

One point remains: why do these results hold only for low-IQ sibships where the proband is male and not female? Part of the answer appears to be that there are fewer low-IQ female sibships to start with. In addition, as suggested earlier, there are almost certainly different biological factors, for example, a different incidence of brain damage and cultural factors operating in the two genders which could affect the onset and identification of the illness and the probability of admission of the patient to hospital. Clearly schizophrenic research, particularly when it is dealing with behavioural antecedents, must consider the sexes separately.

In any event it is apparent that the previously reported differences in school performance between schizophrenics and their siblings do not apply equally to all pre-schizophrenics, but apply most strongly to those from low-IQ sibships where the schizophrenic-to-be is a boy.

#### SUMMARY

School record data including repeating, IQ score and last regular school grade completed were collected on 51 male and 65 female adult schizophrenics, their siblings and age mates. The school performance of male schizophrenics was inferior to female schizophrenics on all three measures. The male probands but not the female probands did significantly more poorly in school than their age mates. There was a sizeable group of low-IQ males, but not low-IQ females, who received a diagnosis of schizophrenia in a state hospital setting. The within-family results indicated that the pre-schizophrenic differed consistently on school performance from both his siblings and age mates only when the schizophrenic-to-be was a boy who belonged to a low-IQ sibship. The significance

of these results in understanding the relationship among schizophrenic illness, sex and IQ level is examined.

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## The Home Behaviour of Schizophrenic Patients Living in the Community and Attending a Day Centre

By LOUIS BYRNE, TERESA O'CONNOR and T. J. FAHY

### INTRODUCTION

With large numbers of psychotic patients now living in the community, there is growing appreciation of the influence of family life on the long-term social outcome of chronic schizophrenia. From the work of Brown, Birley and Wing (1972) it appears that to achieve and maintain optimum clinical stability in 'typical' chronic schizophrenia, it is desirable that face-to-face contact between patients and emotional relatives should be held to a minimum and that phenothiazine drugs should be used to soften the impact on the patient of sudden and stressful life changes. Reviewing the many social problems which accrue from this general treatment approach, Stevens (1973) noted a distinct lack of evaluative study of psychotic patients who actually live in the community.

The present report deals with an aspect of day care for chronic schizophrenic patients which does not appear to have been examined before in a detailed way. The investigators set out to discover if the home behaviour of schizophrenic patients attending a day centre would differ in important ways from their concurrent behaviour at the day centre.

### THE DAY CENTRE

A day centre was opened in 1969 in a Dublin suburb as an alternative to long term in-patient stay (continual or intermittent) for seriously disabled psychiatric patients—in particular, those suffering from severe chronic schizophrenia. The centre is a rented community hall staffed by three nurses, one of whom is responsible for public relations and liaison with local industry. A psychiatrist visits twice weekly. The chief therapeutic activity is light industrial work, contracted locally, for which patients are paid at factory rates. Criteria for admission

of patients to the centre include unusual severity and chronicity of disability and the availability of relatives willing that patients should live and sleep at home each night and at weekends.

### CASE MATERIAL

Of 28 patients regularly attending the centre in 1970, 20 had indubitable long-standing schizophrenia as defined in the International Classification of Diseases, Section 295.6. As Table I indicates, this was a group of very disabled patients of the kind that presents difficult problems of rehabilitation in any psychiatric service. Several patients had been ill for over twenty years, and the two least disabled were considered too handicapped for acceptance by an industrial rehabilitation unit described by Lynch and Burke (1972). It should be appreciated that this was not a 'neglected' group of patients: for some years before the opening of the day centre these patients had been socially unresponsive to the attentions of a psychiatric team based on a modern open-door hospital with a decided bias towards extra-mural care. When the present study began ten

TABLE I

*Characteristics of 20 schizophrenic patients living in the community and attending a day centre*

---

|                                                                             |
|-----------------------------------------------------------------------------|
| <i>Age:</i> 29-67, mean 46 years                                            |
| <i>Sex:</i> 13 men, 7 women                                                 |
| <i>Marital status:</i> 16 single, 1 married, 1 separated, 2 widowed         |
| <i>Social class:</i> All class V (estimated)                                |
| <i>Years since first psychiatric consultation:</i> 3-24.<br>Mean 10.4 years |
| <i>Accumulated time in hospital:</i> 0.5-16, mean 5 years                   |
| <i>Years since gainfully employed:</i> 4-25, mean 10.6 years                |

---

patients were already living in the community for some months and ten had been recently discharged from hospital. All were attending local out-patient clinics and were receiving phenothiazine drugs.

#### METHODS OF STUDY

The task was to measure in a reliable way the illness behaviour of these patients both at the day centre and at home. Four measures of clinical or social behaviour were used:

(1) A *behavioural check list* modified from Wing and Brown (1970) was completed twice for each patient. This check list comprised twelve three-point scales covering a wide range of pathological behaviour. One of us (L.B.), completed the list at the day centre using nursing staff as informants; the 'home rater', an experienced psychiatric nurse (T.O'C.) conducted an identical interview in the home setting using relatives as informants. Prior to the study, an inter-rater reliability ( $r$ ) of 0.95 was recorded in a practice run on 12 chronic schizophrenic in-patients. The following assessments were completed at the day centre only:

(2) A semi-structured appraisal of *work performance* (Cheadle, Cushing, Drew and Morgan, 1967) consisting of 18 three-point scales covering such items as punctuality, speed of work, ability to grasp instructions, dexterity and concentration.

(3) An objective measure of *productivity*, based on the difference between a patient's performance on a simple work task and the

performance of one of the nursing staff on the same task over a measured period of time.

(4) An abbreviated examination of *mental state* modified from Wing and Brown (1970).

Ratings were conducted blind and were scored in the direction of increased pathology. The home rater was not familiar with the patients, and the other raters carried no direct clinical responsibility for them. Families of patients were not previously influenced in their attitudes to the day centre by home visits or social worker support. Home ratings were completed within a week of assessments at the day centre, and all ratings covered current behaviour and behaviour in the previous week.

#### RESULTS

*Test inter-correlations* are in Table II. The objective measure of productivity correlated significantly with all behavioural measures, in particular with the behavioural check list scores recorded at the day centre ( $r = 0.52$ ), indicating the concurrent validity of the latter test. (The rather high correlation of 0.87 between the day centre behavioural score and work performance at the day centre was probably inflated by the similarity of certain items across the two scales).

#### Prediction of home behaviour

Home behaviour failed to correlate significantly with behaviour at the day centre ( $r = 0.36$ , N.S.), although the trend was in the predicted direction. Correlations between home behaviour and all other measures were just significant, although the sizes of the correlations

TABLE II  
Correlation (Spearman's  $R$ ) matrix ( $N = 20$ )

|                        | 1     | 2      | 3     | 4      | 5   |
|------------------------|-------|--------|-------|--------|-----|
| BCL† (Home)            | 1.0   |        |       |        |     |
| BCL (Day centre)       | 0.36  | 1.0    |       |        |     |
| Poor mental state      | 0.39* | 0.30   | 1.0   |        |     |
| Poor work performance  | 0.42* | 0.87** | 0.28  | 1.0    |     |
| Poor work productivity | 0.41* | 0.52** | 0.38* | 0.75** | 1.0 |

† BCL = Behavioural Check List.

\*  $P < .05$  (one-tailed test)

\*\*  $P < .01$  (one-tailed test)

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were never impressive, and the best of a poor set of predictors of home behaviour was the general level of performance at work ( $r = 0.42$ ,  $P < .05$ ).

#### *Home behaviour versus behaviour at the day centre*

A mean behavioural check list total score of 17.7 at the day centre did not differ significantly from a mean of 18.6 recorded by the home rater. Thus the general level of illness behaviour at home for the total group of patients was much the same as that observed at the day centre. The basis of comparison was, of course, imperfect, since close relatives and nursing staff, respectively, undoubtedly had somewhat different perceptions of what constituted significant illness behaviour. However, the mean score for the 12 schizophrenic inpatients of the reliability study was 19.4, giving a logical escalation of illness behaviour from day centre through home to hospital—an indication that these data have some validity.

Despite similar mean behavioural scores for the group of 20 patients, the correlation between home and day centre behaviour for individual patients was insignificant. This raised the possibility of important differences in behaviour between home and day centre for individual patients. Fig. 1 compares home and day centre behaviour across the twelve three-point scales of the behavioural check list for the 20 patients. Social withdrawal, poor appearance, few leisure interests, lack of conversation, slow movement, laughing to oneself, underactivity, overactivity, and threatening or violent behaviour were the items noted by families in that order of frequency and severity. At the day centre, on the other hand, incongruity of affect, poor appearance, lack of leisure interests, slowness of movement, social withdrawal, underactivity, posturing and mannerisms were noted in that order. For each of the twelve items of the behavioural check list, the differences in mean ratings between home and day centre never reached the 5 per cent level of significance using a t-test for correlated samples. A clinically important (but statistically insignificant, perhaps due to small sample size) finding was that five patients were overtly threatening or violent at home, none of whom showed aggressive

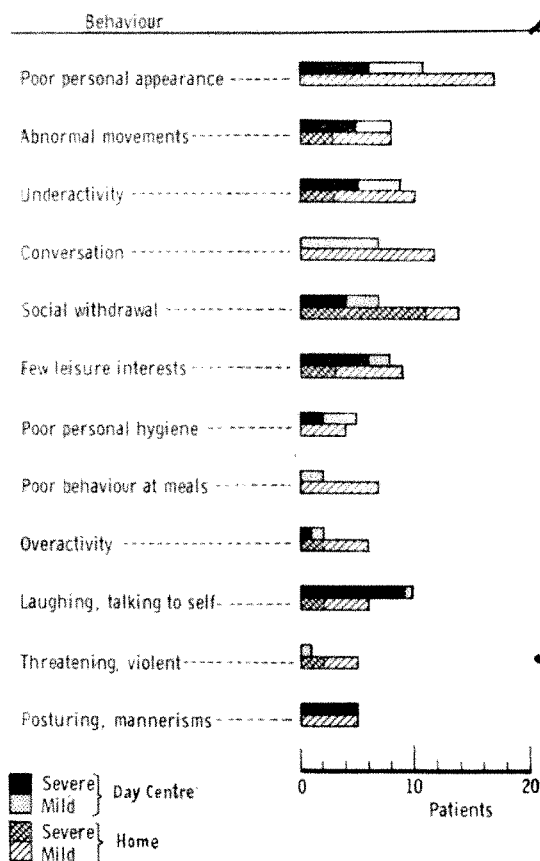


Fig. 1.—Degrees of impairment of behaviour amongst twenty patients at home and at day centre.

behaviour at the day centre. Another patient was aggressive at the day centre but not at home. Remarkably, relatives had never complained of the behaviour of the five patients aggressive at home although they had had opportunity to do so.

#### *Follow-up*

More intensive home visiting and closer medical supervision were instituted for one year in the hope of alleviating family burden in the homes of the five patients who were aggressive at home but not at the day centre. A year later, three of these patients had improved but were still intermittently aggressive; the two remaining patients remained aggressive despite closely supervised medication, frequent visiting and, in one instance, removal of the patient to a hostel.

At two year follow-up, 13 of the 20 patients were regularly attending the day centre and two of these were successfully placed in part-time open employment. Two had died of natural causes and one was in a general hospital for treatment of pulmonary tuberculosis. Three had abandoned the centre but remained in out-patient care, and one other patient remained at home and refused any kind of psychiatric attention. Most patients improved markedly over a period of two years with respect to general social performance, and the earning power of those still at the day centre had more than doubled. This favourable impression received some support from retest scores on the behavioural check list by repeat home interviews, but the gains were insignificant and the follow-up data were open to the influence of favourably biased reporting by relatives.

A total of 30 re-admissions to in-patient care, usually for short periods only, was required for the 20 patients over a two year period of follow-up. The six aggressive patients accounted for a significantly greater number of re-admissions than did the remainder (16 *v.* 14,  $P < .01$ ).

All except one family expressed continuing satisfaction with day centre care and definitely preferred this to in-patient care.

#### CONCLUSIONS

Although statistically inconclusive, these findings permit the general statement that among patients with severe chronic schizophrenia living in the community and attending a day centre the general level of illness behaviour at the centre was roughly similar to that perceived in the home by patients' relatives. However, prediction of home behaviour from performance at the day centre was quite difficult in the individual case and could not be achieved with certainty under the conditions of this study. It follows that a systematic policy of home visiting and a deliberate attempt to lighten the burden on the family is an essential component of any programme of this kind. Occasional marked disparity between home and day centre behaviour also carries implications for assessment of research findings: changes in behaviour induced, for example, by operant

techniques in clinical settings (Fernandez, Fischer and Ryan, 1973) may not always generalize to the home or to the work situation.

The very high level of 'consumer satisfaction' among relatives at two year follow-up is attributed partly to the simple expedient of removing a disruptive patient from the family circle during the day, the advantage to families of extra money brought home by the patient each week, and, finally, the encouraging and supportive influence of community-based nursing staff attached to local out-patient clinics.

Although we are satisfied that all our patients improved to some extent in social performance, it is clear from the results that day care of the kind described here is one aspect only of rehabilitation and is clearly not suitable for every patient with chronic schizophrenia. The early detection of those patients who will derive most benefit is not easy, but persistently aggressive behaviour was associated in this study with high rates of readmission to hospital and minimal improvement in social performance at two-year follow-up. It may be that such patients ought to be cared for in hostels from an early stage if extramural care is contemplated. Finally, the great tolerance of our families to the presence of disruptive patients in the home may owe something to low initial expectations and might not apply to case material of greater affluence and higher social class.

#### SUMMARY

Twenty chronic schizophrenic patients attending a day centre and living at home were assessed at the day centre on measures of illness behaviour, work performance, productivity and mental state. Concurrent illness behaviour was also measured in the home setting. The mean level of illness behaviour reported by day centre staff was not significantly different from that recorded at home interviews with patients' families.

Correlations between home and day centre behaviour for individual patients were insignificant, and the pattern of illness behaviour at home was sometimes quite different from that at the day centre. In particular, five patients were overtly aggressive at home but not at the



day centre, and another patient showed this pattern in reverse. A high level of 'consumer satisfaction' among relatives was maintained at two year follow-up. Although all patients improved somewhat in social performance, the poorest results were obtained with persistently aggressive patients who needed significantly more hospital readmissions and showed least improvement in social performance. These findings have practical implications for extra-mural care and for assessment of research findings.

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# The Leucocyte Antigenic System HL-A as a possible Genetic Marker of Schizophrenia

By C. L. CAZZULLO, E. SMERALDI and G. PENATI

Many inheritance models of schizophrenia have been proposed, in view of its variable age at onset, variable familial occurrence and the relevant influence of a great number of environmental factors (Gottsmann and Shields, 1967; Heston, 1970; Ödegård, 1972). However, the real genetic predisposition to schizophrenia has not yet been experimentally verified, and genetic markers have to be looked for, i.e. we need some character, genetically determined, whose transmission is associated with schizophrenia transmission: the more polymorphous the character, the greater will be the probability of finding such associations.

The lack of success hitherto of investigations for genetic markers may depend on there being a polygenic inheritance of the disease, because in diseases with such a kind of inheritance it is difficult for a marker to be displayed. If found, therefore, a schizophrenia marker might support the hypothesis of a complex multifactorial background, where, however, one gene is predominant, to whom the genetic marker is related. In our study we investigated the HL-A distribution in Italian schizophrenic patients, considering that leucocyte HL-A antigens may be possible markers of the disease, as it has been demonstrated in a number of diseases including polygenically inherited ones (Walford *et al.*, 1971; Russel *et al.*, 1972; Kissmeyer-Nielsen and Thorsby, 1970).

It must here be remembered that HL-A antigens, detected on most human cells, are controlled by at least two very closely linked subloci on the same chromosomal region, each containing a great number of mutually exclusive alleles. The number of antigens which can be actually identified is 9 for the first sublocus and 21 for the second sublocus; however the real number of these antigens is thus far unknown (Kissmeyer-Nielsen, 1972).

## MATERIALS AND METHODS

This investigation has been performed on 53 unrelated schizophrenic patients, of whom 30 were female and 23 male. All patients were known and followed at our Institute over a period of years. We did not include in our study patients from a different ethnic group than Italian, to avoid influences deriving from different H-LA distribution among races.

Typing for HL-A specificities was done by the lymphocyte microtoxicity test (Mittal *et al.*, 1968) employing a test panel of 51 antisera defining 14 antigenic specificities: HL-A1, 2+W28, 3, 9, 10, 11 of the first sublocus; HL-A5, 7, 8, 12, 13, W15, W17, W27 of the second sublocus. As in our previous studies (Cazzullo and Smeraldi, 1972) sera were mostly supplied by the NIH Bank and partly were raised in our laboratory from multiparous women. At least three antisera were used to define each specificity. However, W28 was identified only by antisera cross-reacting with HL-A2; so we took their frequencies together. Probabilities were computed by  $\chi^2$  test, using Yate's correction for the small numbers.

Control HL-A phenotype frequencies were determined in a group of 386 healthy Italian volunteers comparable to experimental sample as to geographic area and racial type.

## RESULTS

Results are listed in Table I. HL-A10 and HL-A13 have a lower but not significantly different frequency in schizophrenic patients and in control subjects.

TABLE I

| Antigens                               | Frequency (%) in |                                | $\chi^2$ |
|----------------------------------------|------------------|--------------------------------|----------|
|                                        | Controls         | Schizo-<br>phrenic<br>patients |          |
| I series                               |                  |                                |          |
| HL-A <sub>1</sub> .. ..                | 26               | 40                             | .98      |
| HL-A <sub>2</sub> + W <sub>28</sub> .. | 47               | 45                             | .02      |
| HL-A <sub>3</sub> .. ..                | 22               | 19                             | .07      |
| HL-A <sub>9</sub> .. ..                | 28               | 36                             | .12      |
| HL-A <sub>10</sub> .. ..               | 24               | 11                             | 3.65     |
| HL-A <sub>11</sub> .. ..               | 7                | 9                              | .19      |
| II series                              |                  |                                |          |
| HL-A <sub>5</sub> .. ..                | 24               | 23                             | .01      |
| HL-A <sub>7</sub> .. ..                | 9                | 9                              | .03      |
| HL-A <sub>8</sub> .. ..                | 11               | 15                             | .31      |
| HL-A <sub>12</sub> .. ..               | 19               | 21                             | .03      |
| HL-A <sub>13</sub> .. ..               | 9                | 2                              | 2.31     |
| W <sub>15</sub> .. ..                  | —                | 12                             | —        |
| W <sub>17</sub> .. ..                  | —                | 2                              | —        |
| W <sub>27</sub> .. ..                  | —                | 8                              | —        |
| No. of subjects ..                     | 386              | 53                             |          |

No difference is significant at the 5% level

TABLE II

| Antigens                              | Frequency (%) in             |                           | $\chi^2$ |
|---------------------------------------|------------------------------|---------------------------|----------|
|                                       | Hebe-<br>phrenic<br>patients | Para-<br>noid<br>patients |          |
| I series                              |                              |                           |          |
| HL-A <sub>1</sub> .. ..               | 46                           | 11                        | 4.29*    |
| HL-A <sub>2</sub> +W <sub>28</sub> .. | 50                           | 39                        | .06      |
| HL-A <sub>3</sub> .. ..               | 17                           | 17                        | 0.00     |
| HL-A <sub>9</sub> .. ..               | 25                           | 50                        | 1.82     |
| HL-A <sub>10</sub> .. ..              | 13                           | 11                        | .12      |
| HL-A <sub>11</sub> .. ..              | 13                           | 11                        | .12      |
| II series                             |                              |                           |          |
| HL-A <sub>5</sub> .. ..               | 13                           | 39                        | 2.63     |
| HL-A <sub>7</sub> .. ..               | 8                            | 11                        | .58      |
| HL-A <sub>8</sub> .. ..               | 17                           | 6                         | .98      |
| HL-A <sub>12</sub> .. ..              | 25                           | 17                        | .08      |
| HL-A <sub>13</sub> .. ..              | 0                            | 6                         | .02      |
| W <sub>15</sub> .. ..                 | 17                           | 0                         | 1.66     |
| W <sub>17</sub> .. ..                 | 0                            | 6                         | .02      |
| W <sub>27</sub> .. ..                 | 13                           | 0                         | .91      |
| No. of subjects ..                    | 28                           | 20                        |          |

\*  $P < 0.05$ .

The essential phenomenological unhomogeneity of the schizophrenic population has induced us to group our patients in more homogeneous groups according to the classic nosographic criteria. HL-A frequencies in 28 hebephrenic and 20 paranoid patients are compared in Table II. Catatonic patients were too few (5 subjects only) to be included in this comparison. Hebephrenic patients show a significantly higher frequency of HL-A1 ( $\chi^2 = 4.29$ ;  $P < 0.05$ ). In paranoid patients HL-A9 and HL-A5 are increased, whereas W15 and W27 are decreased. In any case, however, significance is not reached.

## DISCUSSION

Present investigation represents a further approach to the problem of the inheritance of schizophrenia, and suggests some possible interesting developments perhaps through a familial analysis of HL-A distribution in such patients. However, when comparing HL-A frequencies even in two samples of the same homogeneous population, there is a considerable chance to keep out significant deviations of one or more HL-A antigenic frequencies. The best way to avoid chance errors is to perform a limited pilot investigation on a small group of patients and test the validity of deviations found in a further independent study. So we are now trying to confirm present results in a second patient series. That would be the strongest evidence of the association between

HL-A1 and hebephrenic patients, and also may eventually clarify the significance of differences, although not statistically relevant, found in HL-A9, A5, W15 and W27 between hebephrenic and paranoid patients. Moreover a higher number of investigated patients may allow us to employ other criteria such as the evolution pattern, the deterioration rate and gene penetration.

Finally, it must here be stressed that it is not strange to find more marked differences in HL-A distribution between schizophrenic groups than between overall schizophrenic patients and normal controls. In fact this is a common event in biological psychiatry, and probably derives from failing a nosographic criterion that considers patient's biological constitution (Snezhnevsky and Vartanyan, 1970; Planansky, 1972).

Our results are obviously related only to the Italian population, because schizophrenic HL-A phenotypes may vary significantly among races, according to the different HL-A original distribution. Multifactorial influences also, in conjunction with polygenic genetic background of the disease, may be reflected in variations of the HL-A phenotypes in populations in view of different environmental influences having a selective pressure.

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## A Follow-up Study of Female Narcotic Addicts: Variables Related to Outcome

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### INTRODUCTION

The poor prognosis of narcotic dependence is generally recognized, but this is a field in which it is specially difficult to make predictions about the outcome of treatment in the individual patient. Vaillant (1966a) noted that abstinence appears to depend more on the addict's ability to discover satisfying alternatives to his addiction than on methods of treatment. In an attempt to identify prognostic indicators in narcotic dependence a number of follow-up studies have examined the relationship between outcome and various social and psychological characteristics of the patients studied. While most follow-up studies are of male addicts or of samples containing only a small proportion of women, the present study is concerned with the outcome in a sample of 66 female narcotic addicts.

### PATIENTS AND METHODS

The sample of 66 patients included all women dependent on heroin who were admitted to Holloway Prison (on remand or on sentence) during an 18 month period from January 1967 to June 1968. Their social characteristics, history of drug use and patterns of delinquency are described in the original study (d'Orbán, 1970). A base-line follow-up was carried out in September 1968, three months after the collection of the sample. Four years later (in September 1972) data were again obtained from the Drugs Branch of the Home Office on the patients' addiction status, on admissions notified by hospitals, and on the causes of deaths that had occurred. Absence of any further notification to the Home Office Drugs Branch throughout the four years of follow-up was used as the criterion of abstinence from narcotics. The Register of Deaths at Somerset House was

searched for the names of 31 patients who at the end of the follow-up period were no longer on the Home Office register; no additional deaths were discovered through this source. Data on delinquency during the four years of follow-up were obtained from criminal records. Continued personal contact at some time during the period of follow-up was possible with 31 patients who were re-admitted to Holloway Prison. From the time of entry into the sample patients were followed for a mean period of 4 years 11 months, with a range from 4 years 3 months to 5 years 9 months.

### RESULTS

#### 1. *Addiction status*

The status of the patients at the end of the fourth year of follow-up (in September 1972) is shown in Table I. Omitting those who had died, emigrated or were in institutions, only 51 patients were still at risk of addiction. Expressed in terms of the proportion of those at risk, 41 per cent of the patients were still addicted, 47 per

TABLE I  
*Outcome after four years*

| Outcome                                          | No. of patients | Per cent |
|--------------------------------------------------|-----------------|----------|
| Died .. .. .                                     | 10              | 15       |
| Emigrated .. .. .                                | 2               | 3        |
| In institutions .. .. .                          | 3               | 5        |
| On narcotics (registered at clinics) .. .. .     | 21              | 32       |
| Off narcotics (not notified for 4 years) .. .. . | 24              | 36       |
| Status uncertain                                 |                 |          |
| Withdrawn during 1972 .. 3                       | 6               | 9        |
| Not notified for 1 year .. 3                     |                 |          |
| Total .. .. .                                    | 66              | 100      |

cent were off narcotics, and in 12 per cent because of the short time lapse since last notification the addiction status was regarded as uncertain.

## 2. Causes of death

Of the 10 patients who died, one committed suicide by hanging whilst she was in hospital. The remaining 9 patients died of the complications of drug misuse. Two died of septicaemia (associated with meningitis in one case and with acute bacterial endocarditis in the other), and 7 died of non-suicidal drug overdosage (1 with methadone, 4 with barbiturates and 2 with barbiturates, heroin and methadone). Thus barbiturates were implicated in 6 deaths, 4 of which occurred in 1970 at the height of the epidemic of intravenous barbiturate misuse. The mean age at death was 22.5 years.

## 3. Delinquency and narcotic dependence

Omitting the 10 patients who died and the 2 who emigrated, 54 patients remained in the cohort throughout the four years of follow-up. These patients were divided into four groups in terms of their addiction status and their delinquency during the follow-up period (Table II). The groups were defined as follows:

*Group I* (delinquent and addicted): Patients who were convicted of offences during the period of follow-up and who were also notified as dependent on narcotics in at least two of the four years (all but 3 patients in this group were notified in three of the four years).

*Group II* (neither): Patients who had no further convictions and who were not notified as dependent on narcotics in any of the four years of follow-up.

*Group III* (delinquent only): Patients who were

convicted of offences during the period of follow-up but were not notified as dependent on narcotics.

*Group IV* (addicted only): Patients who had no further convictions but who were notified as dependent on narcotics in at least two of the four years of follow-up.

In all, 33 patients were convicted of further offences during the period of follow-up and 30 remained dependent on narcotics in at least two of the four years, but the two forms of deviant behaviour coincided in 25 patients, 46 per cent of the sample remaining at risk. A further 30 per cent of patients simultaneously relinquished both their narcotic dependence and their delinquent behaviour. Thus delinquency and narcotic dependence ran a parallel course in over three-quarters of the sample remaining at risk. The association between continued narcotic dependence and continued delinquency during the period of follow-up was highly significant ( $\chi^2 = 14.027$ , d.f.1,  $p < 0.001$ ).

## 4. Variables related to outcome

The data were examined with regard to 8 variables which were selected as having possible prognostic significance. Table III summarizes the findings in the four groups and in the 10 patients who died (the 2 patients who emigrated were omitted from this comparison).

### (i) Differences between Group I and Group II

The finding of a highly significant association between narcotic dependence and delinquency in these patients suggested that a combined assessment in terms of addiction status and criminality would provide a better measure of their social adjustment during the period of follow-up than if addiction status were used as the sole criterion of outcome. Those with the worst outcome were patients in Group I who continued to be addicted and to commit offences, while the best outcome was in patients in Group II who relinquished both their delinquency and their narcotic dependence throughout the four years of follow-up. The statistical comparisons between these two groups are shown in Table IV. Two of the variables (age and broken homes) were omitted from this comparison as they showed little variation in

TABLE II

*Narcotic dependence and delinquency in follow-up period*

|                                           | No. of patients | Per cent |
|-------------------------------------------|-----------------|----------|
| Group I (delinquent and addicted) .. .. . | 25              | 46       |
| Group II (neither) .. .. .                | 16              | 30       |
| Group III (delinquent only) .. .. .       | 8               | 15       |
| Group IV (addicted only) .. .. .          | 5               | 9        |
| Total .. .. .                             | 54              | 100      |

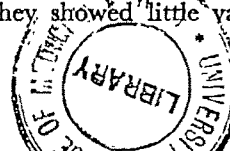


TABLE III  
*Variables related to outcome (64 patients)*

| Variable                                                                              | Group I<br>(N=25) | Group II<br>(N=16) | Group III<br>(N=8) | Group IV<br>(N=5) | Died<br>(N=10) |
|---------------------------------------------------------------------------------------|-------------------|--------------------|--------------------|-------------------|----------------|
| 1. Mean age at end of follow-up period (or at death) .. .. .                          | 25.2              | 25.6               | 25.7               | 28.0              | 22.5           |
| 2. Mean age of first drug abuse .. .. .                                               | 16.1              | 17.5               | 17.1               | 16.8              | 16.7           |
| 3. Mean duration of narcotic dependence (in months) at time of entry to the sample .. | 17.8              | 14.0               | 9.2                | 19.2              | 15.5           |
| 4. Mean number of previous convictions prior to follow-up .. .. .                     | 3.8               | 1.2                | 3.0                | 1.8               | 4.1            |
| 5. Number who committed offences prior to narcotic dependence (N=40) .. .. .          | 16 (64%)          | 7 (44%)            | 6 (75%)            | 2 (40%)           | 9 (90%)        |
| 6. Broken home before age 16 (N=42) .. .. .                                           | 16 (64%)          | 10 (62%)           | 5 (62%)            | 2 (40%)           | 8 (80%)        |
| 7. Homosexual orientation (N=32) .. .. .                                              | 16 (64%)          | 4 (25%)            | 5 (62%)            | 1 (20%)           | 6 (60%)        |
| 8. Intelligence (mean score on Raven's Progressive Matrices) .. .. .                  | 43.0              | 39.4               | 47.0               | 40.7              | 41.3           |

TABLE IV  
*Statistical comparisons between groups I and II*

| Variable                                            | Group I<br>(N=25) | S.D. | $\chi^2$ | Group II<br>(N=16) | S.D. | $\chi^2$ | t    | Significance |
|-----------------------------------------------------|-------------------|------|----------|--------------------|------|----------|------|--------------|
| Age of first drug use .. .. .                       | 16.1              | 2.2  | —        | 17.5               | 4.0  | —        | 1.43 | N.S.         |
| Duration of narcotic dependence (in months) .. .. . | 17.8              | 21.0 | —        | 14.0               | 10.0 | —        | 0.65 | N.S.         |
| Number of previous convictions ..                   | 3.8               | 2.7  | —        | 1.2                | 1.6  | —        | 3.27 | $p < 0.005$  |
| Offences prior to addiction (N=40) .. .. .          | 16                | —    | 0.827    | 7                  | —    | 1.734    | —    | N.S.         |
| Homosexual orientation (N=32) ..                    | 16                | —    | 4.685    | 4                  | —    | 4.891    | —    | $p < 0.05$   |
| Intelligence (score on Raven's Matrices) .. .. .    | 43.0              | 5.2  | —        | 39.4               | 8.5  | —        | 1.35 | N.S.         |

the four groups. Of the 8 variables examined, only 2 showed a significant difference between Groups I and II.

1. Significantly more patients with a homosexual orientation continued to be delinquent and addicted; conversely, among those with a good outcome there were significantly more women who showed no homosexual behaviour ( $p < 0.05$ ).

2. The mean number of previous convictions before the base-line follow-up (in September 1968) was significantly different in the two groups ( $p < 0.005$ ).

The group of 10 patients who died had the highest mean number of previous convictions, and 9 of the 10 had a history of delinquency before their addiction ( $\chi^2 = 4.265$ , d.f.1,  $p < 0.05$ ).

#### (ii) Variables related to abstinence

A separate comparison was made on 5 of the 8 variables between the 24 patients who were abstinent throughout the period of follow-up (Groups II and III) and the 30 patients who remained dependent on narcotics (Groups I and IV). The results (Table V) indicate that when addiction status is used as the sole criterion of outcome the number of previous convictions again shows a significant inverse association with abstinence. However, homosexuality is not significantly related to outcome in terms of addiction status. A comparison of the numbers with homosexual orientation among the 33 patients who continued to commit offences during the period of follow-up (Groups I and III) and the 21 patients with no further convictions (Groups II and IV) shows a significant excess of

TABLE V  
Variables related to abstinence

| Variable                                 | Abstinent<br>(N=24) | S.D. | Addicted<br>(N=30) | S.D. | $\chi^2$ | t    | Signifi-<br>cance      |
|------------------------------------------|---------------------|------|--------------------|------|----------|------|------------------------|
| Age of first drug use .. .. .            | 17.4                | 3.6  | 16.2               | 2.1  | —        | 1.44 | N.S.                   |
| Duration of narcotic dependence (months) | 12.4                | 12.9 | 18.1               | 20.1 | —        | 1.14 | N.S.                   |
| Number of previous convictions ..        | 1.8                 | 1.9  | 3.4                | 2.7  | —        | 2.43 | $p < 0.02$             |
| Offences prior to addiction (N=40) ..    | 13                  | —    | 18                 | —    | 0.195    | —    | N.S.                   |
| Homosexual orientation (N=32) ..         | 9                   | —    | 17                 | —    | 2.029    | —    | N.S.<br>( $p < 0.20$ ) |

patients with homosexual orientation among the further offenders ( $\chi^2 = 8.117$ , d.f.1,  $p < 0.005$ ). The findings suggest that, although homosexuality is associated with poor outcome when this is assessed in terms of addiction and delinquency, the significance of this relationship is with subsequent delinquency rather than with subsequent addiction.

#### DISCUSSION

A methodological shortcoming of this study is that the information available on the group with a good outcome is largely of a negative kind; they were not notified as addicts and had no further criminal record. Although we have no knowledge about the quality of their subsequent social adjustment, from the point of view of narcotic dependence the outcome was favourable when compared with the findings of other studies. In a comparable group of 40 white female addicts aged under 30, Duvall, Locke and Brill (1963) found a five-year voluntary abstinence rate of 28.6 per cent, and 50 per cent became re-addicted. In samples of male or predominantly male addicts, Vaillant (1966b), O'Donnell (1969) and Chapple *et al.* (1972) reported five year abstinence rates of a similar order: of those known and alive, 20–30 per cent were off narcotics and 50–60 per cent remained involved with drugs.

Although the death rate of female narcotic addicts is generally lower than that of male addicts (James, 1967; Gardner, 1970; Chapple *et al.*, 1972), the women in this study had a very high mortality. Non-suicidal overdosage (usually with barbiturates) was the major cause of death, which is in agreement with the observations of Gardner (1970). The patients who died were a

markedly unstable and delinquent group who had the highest mean number of previous convictions; they were also significantly more often involved in delinquency before their addiction.

A number of follow-up studies have attempted to relate abstinence to various social or psychological characteristics, largely with negative results. The negative findings in the present study are in keeping with the results of other investigators (Vaillant, 1966a; Hitchins *et al.*, 1971; Stephens and Cottrell, 1972; Oppenheim *et al.*, 1973) who have failed to show any relationship between abstinence and intelligence, broken homes, delinquency prior to addiction, age of onset of drug misuse, or duration of narcotic dependence. In female addicts homosexuality is a common manifestation of personality disorder (d'Orbán, 1970; Hawks *et al.*, 1969 and 1970). However, at follow-up homosexuality did not emerge as a useful predictor of addiction status but was significantly associated with subsequent delinquency. Some of the positive findings of other studies cannot be usefully compared with the findings in a sample of young female addicts. Winick (1962) noted a tendency for narcotic addicts over the age of 30 to mature out of addiction, but at the conclusion of the present follow-up the majority of patients were still in their mid-twenties and had not yet reached the age at which maturation from addiction might be expected to occur. Vaillant (1966a) concluded that a stable work record prior to addiction was the best predictor of abstinence. However, in female addicts this is less useful as a predictive factor, as women are generally less likely to be in regular employment. The women in the present sample had almost uniformly unstable work records.

The number of previous convictions was the only variable found to have a significant relationship to outcome, whether this was defined in terms of continued addiction and delinquency or in terms of addiction status alone. Whether narcotic dependence or delinquency occurred first had no influence on outcome. The significant factor appeared to be the duration and extent of involvement in delinquent conduct (as measured by the number of previous convictions) rather than the occurrence of an occasional offence before or since addiction.

The highly significant association between delinquency and narcotic dependence during the period of follow-up suggested that addiction and criminality in this sample of addicts were not independent variables but could best be interpreted as parallel effects of common underlying personality traits leading to social deviance (d'Orbán, 1973). A corollary of this hypothesis is that factors which predict one form of deviance would tend also to predict the other. Previous convictions are known to be a good predictor of delinquency (Mannheim and Wilkins, 1955) and the finding that they are independently related also to addiction status lends support to the view that addiction and delinquency are parallel effects of common underlying causative factors. In recent years delinquency has become a prominent characteristic of young narcotic addicts (James and d'Orbán, 1970; Gordon, 1973). Previous convictions as a prognostic indicator in narcotic dependence may therefore be worth validating in prospective studies of narcotic addicts from samples outside the penal system. The question also arises whether the inverse relationship found in this study between previous convictions and subsequent abstinence in female addicts is sex-specific or whether it applies also to male addicts. The aetiology of crime in females differs in many ways from that in males (d'Orbán, 1971), and female delinquents deviate more from social and psychological norms than male delinquents (Cowie *et al.*, 1968). It is therefore possible that in women previous convictions are a better measure of social deviance than in men and that the association found here with the prognosis of narcotic dependence may not apply to male addicts.

#### SUMMARY

Sixty-six female narcotic addicts first examined in 1967-68 were followed up four years later by reference to Home Office records. Thirty-six per cent had become abstinent, 32 per cent had remained addicted and 15 per cent had died. Comparisons were made on eight variables between those with a good outcome and those with a poor outcome. Outcome was assessed in terms of continued addiction and delinquency and in terms of addiction status alone. The number of previous convictions showed a significant inverse relationship to abstinence; this association may be worth validating in prospective studies of both sexes.

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## A Comparison Between the Personality Changes in Certain Forms of Psychomotor and Grand-Mal Epilepsy

By PER KRISTIANSON

Some controversy exists regarding the notion that personality disturbance is specifically related to temporal-lobe epilepsy. A number of investigators have found no psychometric or psychiatric differences between psychomotor epileptics with a temporal-lobe focus and non-temporal epileptics with 'centrencephalic' or diffuse epilepsy or jacksonian sensorimotor epilepsy. But it is possible that the 'negative' findings in these studies may be explained by the reported acute psychoses caused by changes in anti-epileptic medication, or by the use of groups that were too heterogeneous or institutionalized and the use of less well-defined psychiatric and psychological variables. However, Janz (1969) has described a more primary, homogeneous, common and not serious form of grand-mal epilepsy, 'Aufwach' epilepsy, with psychiatric and Rorschach-test characteristics of a kind different from the corresponding characteristics of 'Schlaf' grand-mal epilepsy and psychomotor epilepsy. Furthermore, Meier and French (1965) obtained certain results with the MMPI test for a group of psychomotor epileptics with bilateral EEG temporal-lobe abnormalities. A separate analysis of this group showed that the presence of independent bitemporal EEG abnormalities was associated with the most and highest scale elevations.

The present study is intended to illustrate the above clinical problem and investigate in what respects the MMPI profile of a patient from the Östfora institution for alcoholics, outside Uppsala, with mainly grand-mal seizures of 'Aufwach' epilepsy type, differs from the two previously mentioned MMPI measurements of Meier and French. New interpretations of some MMPI scales are used in order to obtain better defined test measurements.

### *The grand-mal patient*

The patient is 34 years old and his grand-mal seizures began when he was 18 years old. Each year since then he has had mainly grand-mal attacks but also occasional seizures described as vertigo. The grand-mal seizures usually last for 15-20 minutes and do not occur during sleep, but may be triggered the following day on account of lack of sleep and abuse of alcohol. The attacks of vertigo, which probably are of psychomotor origin, become more frequent in the spring, tend to last 1-2 minutes and are associated with restlessness, anxiety and depression. Some pathological EEGs, with episodes of dysrhythmic, unspecific 4-7 c/s activity shifting within the

temporal areas, suggest that it was not possible to establish a diagnosis of localized brain lesion. On account of his abuse of alcohol the patient did not take his medication regularly. When admitted to the institution for treatment some time before the test examination, he had several grand-mal seizures and was prescribed diphydan (100 mg.  $\times$  3 daily) and phenemal (100 mg. daily). This dosage may be designated as an average amount of anti-epileptic medication and was not so high as to promote any mental changes, which might be reflected in his MMPI measurement.

On a number of occasions when the patient was depressed, he used phenemal tablets to attempt suicide. Some attempts were of a more dramatic type. He is very quick-tempered, and his behaviour is at times menacing and importunate. But he is not pronouncedly suspicious. Notwithstanding that he is prone to depression and dread, he is usually lucid and open, cheerful and accessible. When he had the opportunity he pursued certain studies with some success.

### RESULTS

The MMPI profile of the 2-4 type for the grand-mal patient with mainly seizures of 'Aufwach' epilepsy type is shown in Fig. 1. The elevations of the point values for scales 2 (Depression) and 4 (Psychopathic deviation) are over 70 *T* points, and the other scales just over 60 *T* points or under 60 *T* points. The 4 (Pd) scale is in a previously published report (Kristianson, 1970) and in a more detailed account (Kristianson, as yet unpublished) interpreted as a measurement of hysterical personality traits. This interpretation of the Pd scale is supported by certain parts of the case history description and by characteristics given by Janz (1969) for epileptics with 'Aufwach' grand-mal seizures. The depression associated with the occasional psychomotor seizures may have influenced the scale 2 in the patient's MMPI profile to some extent. The profiles of the two comparison groups of Meier and French (1965) may also be seen in Fig. 1. Particularly the measurement of the 8 (2-4-6-7-9) type of the bitemporal independent EEG spike-foci group with the 8 (Schizophrenia) scale over 70 *T* points and almost all of the other scales (Depression—Psychopathic deviate—Paranoia—Psychasthenia—Hypomania scales) just under 70 *T* points is distinguished from the profile of the grand-mal patient. This is especially the case with regard to the elevations of scales 6 and 8. Together with the scale 2 these scales measure,

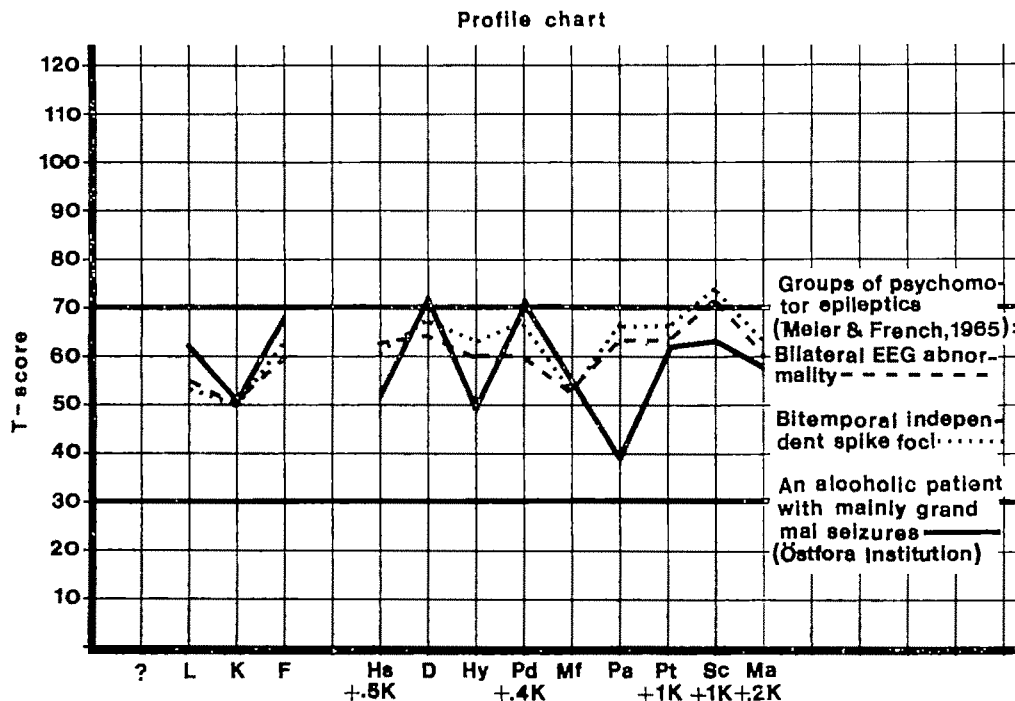


FIG. 1.—Profiles showing the results for two psychomotor groups and an alcoholic patient with mainly grand-mal seizures.

according to Meier and French, a certain tendency to schizo-adaptive and depressive reactions. These reactions are also characteristic of the group with bilateral temporal-lobe EEG abnormalities. However, it is also evident that the above almost equally high values of the profile of the bitemporal independent EEG spike-foci group suggest the presence of a more complex syndrome. This syndrome is interpreted in more detail in a separate report (Kristianson, to be published) as an epileptic personality change, the complete adhesiveness syndrome, characterized mainly by perseverative and paranoid traits but also by a weak tendency to explosive and aggressive paranoiac reactions.

The present study suggests that the MMPI test can be used to differentiate the psychopathology of certain forms of psychomotor and grand-mal epilepsy. But this differentiation seems to be greatly dependent on the nosology of epileptic conditions, the use of relatively homogeneous groups and adequately defined personality traits.

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## Comparison of Self-Ratings of Psychiatric Patients with Ratings made by a Psychiatrist

By M. B. SHAPIRO and F. POST

A large part of the data gathered in psychiatric and clinical psychological research consists of ratings carried out by various members of the clinical team. A set of clinical ratings consists essentially of a questionnaire that is completed by someone who is familiar with the patient. Data of this kind provide information about the way in which members of the clinical team think about their patients; but not necessarily about the ways in which the patients themselves actually behave, feel and think. One would of course expect to find a relationship between the two kinds of data, and both are of psychological interest.

*A priori*, neither kind of data could be said to be more 'valid' than the other. By validity one means the empirically demonstrated correctness of inferences drawn from the data. For example, an investigation might demonstrate that the prognosis of eventual outcome is more accurate when based upon a rating by others than when based upon self-ratings. In such an event one would use ratings by others when making prognoses. On the other hand, if one wanted to investigate mechanisms underlying changes in the experience of mood, one would have no option but to make self-ratings the basis of one's investigations.

This paper reports a series of four experiments, aimed at investigating the relationship between self-rating (S ratings) and ratings by others (R ratings). Each experiment was carried out on an individual patient. All the R ratings were made by the same psychiatrist, the second author.

Simultaneous R and S ratings of the patient's symptoms were obtained on a number of occasions. The aim was to do so under conditions: (a) in which the possibility of discrepancies between the two kinds of ratings would be

minimized, and (b) that conformed as closely as possible to the conditions of day-to-day clinical work.

The investigation sought to answer two questions:

(1) What was the degree of difference between the two kinds of rating? (2) Was the degree of discrepancy related to two of the more obvious parameters: (i) the severity of symptoms, and (ii) the content of symptoms?

### SUBJECTS AND PROCEDURE

Abbreviated clinical descriptions of the four subjects are given in Table I. They all left school at 14 years of age and none had a Mill Hill Vocabulary score above the equivalent of an IQ of 85 (assuming a mean of 100 and S.D. of 16). Cases 1, 2 and 4 were of Irish origin.

The procedure consisted in carrying out weekly R and S ratings, each time in immediate succession. The order was in accordance with a balanced design over four week blocks, thus: SR, RS, RS, SR. R was unaware of the results throughout the experiment. Each kind of rating was directed at exactly the same symptoms and was carried out by exactly the same procedure, to be described later. R interviewed S before making his ratings. He made notes during the interview and made his ratings immediately after S had left. R aimed to make these ratings an expression of his prediction of S's ratings, taking into account both S's 'real' feelings and the degree to which she would overplay or underplay them when she made her ratings.

The ratings were carried out by means of the Personal Questionnaire (PQ) (Shapiro, 1961). A separate questionnaire is constructed for each patient. The items in the questionnaire consist of the patient's own symptoms, which are elicited in a relatively standardized interview. The symptoms are described as far as possible in the patient's own words and are calibrated in terms of the patient's own hedonic standards. A number of points are relevant to the conduct of this particular study.

TABLE I  
*The subjects: clinical summaries*

| Case no. | Age | Status  | Type of illness                                                                                                                                                               | Outcome                                                                                                                     |
|----------|-----|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| 1        | 34  | Married | Life-long obsessive-compulsive but well adjusted person. First depressive illness of recent onset and related to marital stress. Suicidal, but only slight self-depreciation. | Depressive symptoms responded quickly and lastingly to thymoleptic medication.                                              |
| 2        | 28  | Single  | Demanding and explosive personality; marginal work record. Three years of depression, transient hypochondriacal delusions.                                                    | Partial response to ECT. Requiring further in- and out-patient treatment. Remitted after six years.                         |
| 3        | 40  | Married | Three years depression in irritable and phobic personality, related to dislike of new flat. Solely preoccupied with this. Histrionic, but no abnormal thought content.        | Self-discharge after unsuccessful ECT. Improved one month later in new flat.                                                |
| 4        | 47  | Married | Phobic and with superstitious problems. Two years depressed in disliked new house. No other abnormal mental content                                                           | Medication and ECT failed. Continued psychiatric treatments over next eleven years, and regarded as a personality disorder. |

The first point is that R was the consultant psychiatrist responsible for each of the four patients. He carried out his clinical responsibilities in the normal manner and was therefore familiar with the details of each patient's mental state.

Secondly, R was familiar with the method of rating. He had in fact participated in devising the original standardized interview that is used in the construction of the personal questionnaire, and already had had experience in the use of personal questionnaire results in the clinical setting.

Thirdly, R participated in the first stage of the construction of each of their personal questionnaires used in the present study. This participation consisted of co-operating with the psychologists in arriving at a list of symptoms that were of sufficient clinical importance to be included.

Fourthly, when carrying out his interview, R had before him the list of symptom statements which were included in the final questionnaire used by R and S. He made use of the wording and phrasing of these statements when questioning S.

Fifthly, both R and S used exactly the same PQ rating procedure. The method is that of pair comparisons. There are three statements for each symptom: (i) indicating sufficient intensity to warrant treatment, (ii) indicating substantial improvement but not sufficient to warrant cessation of treatment, and (iii) indicating a sufficient degree of recovery to

warrant cessation of treatment. The statements are presented in the three possible pairs typed upon index cards of  $3\frac{1}{4}$  in. by 5 in. For example, the symptom of depression might be represented by three pairs thus:

- (i) I feel very depressed  
I feel somewhat depressed
- (ii) I feel very depressed  
I don't feel depressed
- (iii) I don't feel depressed  
I feel somewhat depressed

Every one of the patient's symptoms is represented in a similar manner. Thus if there were 23 symptoms there would be a total of 69 cards.

The cards are shuffled thoroughly before each rating, so there is an approach to a randomized presentation of the cards. The rater makes a separate judgement on each pair of statements. He or she is instructed to decide which of the two statements is nearer to the present state or the way in which the state is presently viewed. The cards are sorted into two piles, one marked 'top' for when the top statement is chosen and one marked 'bottom' for when the bottom statement is chosen. R tried not to give his sortings more careful attention than he would to any ordinary clinical judgement.

Three additional points should be noted. The first is that the severity of the top and bottom statements on each card were alternated in order to cancel out the effects, if any, of a position set. The second is that the

use of pair comparisons provides us with a method of testing the reliability of the results in terms of the number of inconsistent response patterns. The third is that the method provides us with a four point ordinal scoring system. A score of 1 indicates minimum intensity and a score of 4 indicates maximum intensity of a symptom. Details of all these points are provided by Shapiro (1961).

### RESULTS

#### Reliability

The results can be taken to be highly reliable. The proportions of inconsistent response patterns were very low for both R and S. The proportions for R were 2.8 per cent, 0.5 per cent, 2.3 per cent and 0.4 per cent for Cases 1, 2, 3 and 4 respectively. The equivalent proportions for S were 1.9 per cent, 2.2 per cent, 3.5 per cent and 0 per cent. Purely random responses would produce 50 per cent inconsistent response patterns.

#### Frequency of agreement

There are four degrees of difference provided by the four point scoring system: zero, one point, two point and three points. Differences are not strictly comparable because of the ordinal nature of our scoring system. For example, the psychological distance between the scores of 1 and 2 may be much greater or much smaller than the psychological distance between scores of 2 and 3. Even two zero differences at different parts of the scale cannot be assumed to be 'equal'. However, we have to assume they are comparable in order to obtain a rough idea of the degree of agreement achieved between R and S.

The distribution of differences for each experiment is given in Table II. It will be seen that the proportion of zero differences (ZD's) is almost the same for each experiment, about 60 per cent. The proportions of zero and one point differences combined are very high ranging from 84 per cent to 93 per cent. The proportions of maximum three point discrepancies were, on the contrary, very low. These of course can only occur when R's scores are at 4 and 1, and the percentages were calculated accordingly. The percentages were 1.2, 5.4, 8.9 and 0.5 for Cases 1, 2, 3 and 4 respectively (Table III).

TABLE II  
*Proportion of differences between R and S*

| PQ scale interval              | Case 1 | Case 2 | Case 3 | Case 4 |
|--------------------------------|--------|--------|--------|--------|
|                                | %      | %      | %      | %      |
| 0 .. ..                        | 64.2   | 57.2   | 58.6   | 59.7   |
| 1 .. ..                        | 29.2   | 27.2   | 25.9   | 32.9   |
| 2 .. ..                        | 5.6    | 12.2   | 10.3   | 7.1    |
| 3 .. ..                        | 0.9    | 3.3    | 5.2    | 0.3    |
| 0+1 ..                         | 93.4   | 84.4   | 84.5   | 92.6   |
| R > S ..                       | 27.3   | 14.0   | 23.0   | 8.8    |
| R < S ..                       | 4.6    | 28.9   | 18.4   | 31.5   |
| Total no. of paired ratings .. | 216    | 180    | 174    | 340    |
| No. of occasions               | 9      | 9      | 6      | 17     |

TABLE III  
*The number and per cent of zero (ZD) differences at each R score level*

| R score      | Case 1 |     | Case 2 |     | Case 3 |     | Case 4 |     |
|--------------|--------|-----|--------|-----|--------|-----|--------|-----|
|              | %      | N   | %      | N   | %      | N   | %      | N   |
| 4 ..         | 31.0   | 58  | 60.0   | 15  | 74.7   | 79  | 89.0   | 191 |
| 3 ..         | 36.8   | 19  | 37.9   | 29  | 45.8   | 24  | 28.4   | 81  |
| 2 ..         | 36.0   | 25  | 28.2   | 39  | 24.3   | 37  | 11.3   | 53  |
| 1 ..         | 92.1   | 114 | 74.2   | 97  | 67.6   | 34  | 26.7   | 15  |
| 2+3 combined | 56.8   | 44  | 51.4   | 68  | 54.1   | 61  | 50.0   | 134 |
| 1+4 combined | 1.2    | 172 | 5.4    | 112 | 8.9    | 113 | 0.5    | 206 |

Conventional tests of significance were not computed for these and the other results of the experiments; this was because we were unsure whether the conditions under which our observations were made met the requirements of probability theory.

#### Direction of disagreement

Tables II and III give the proportion of times the R's estimates were greater and less than those of S. There was no consistency from case to case. R tended to make overestimates for Cases 1 and 3 (i.e. rated the patient as more ill than did the patient herself) and to make underestimates for Cases 2 and 4; the differences were relatively large for Cases 1 and

3. Note that the outcome for Cases 1 and 3 was better than for Cases 2 and 4 (Table I).

#### *The relation of differences to score level*

Table III indicates that there is a clear relationship between the score level of R's estimates and the frequency of zero differences. The highest percentages of zero differences (ZD's) are found at the two extremes, with 92 per cent at the 1 score level for Case 1, 74 per cent and 60 per cent for the 1 and 4 levels respectively in Case 2, 68 per cent and 75 per cent at the 1 and 4 score levels for Case 3, and 89 per cent at the 4 score level for Case 4.

At the 2 and 3 score levels, the proportion of ZD's are all below 46 per cent and range from 46 per cent to 11 per cent. In the main, the ZD's are smaller for score level 2 than for score level 3, the three smallest percentages being at the 2 score level. The ZD per cents for the 2 and 3 score levels combined are higher being 57, 51, 54 and 50 for Cases 1, 2, 3 and 4 respectively (Table II). However they are still not as high as those that appeared at the extreme score levels.

#### *The relation of zero differences to symptoms*

The distribution of ZD per cents over symptoms for each of the four cases is given in Table IV. To explain this table, take as an example Case 1. This patient had 24 symptoms, for which the median ZD per cent was 72, and the range was from 33 to 100. To give a more accurate idea of the distribution, the proportion of ZD per cents greater than 79 and less than 31 are also reported; 25 per cent of Case 1's symptoms produced the former and 0 per cent the latter.

Table IV shows that there was considerable variation between symptoms in the frequency of ZD per cents. Inspection failed to reveal a relationship between symptom content and size of ZD per cent. The only clear relationship was with score level for Cases 2, 3 and 4. The majority of high ZD per cents in these three cases were found in symptoms for which R produced ratings at the 1 or 4 score level. The majority of low ZD per cents were found in symptoms which produced a majority of R ratings at the 2 and 3 score level. Case 1 did

TABLE IV  
*Distribution of zero difference per cents over symptoms*

|            | Case 1 | Case 2 | Case 3 | Case 4 |
|------------|--------|--------|--------|--------|
| N symptoms | 24     | 20     | 29     | 20     |
| Median ..  | 72     | 67     | 50     | 56     |
| Range ..   | 33-100 | 11-89  | 17-100 | 24-94  |
| % > 79 ..  | 25.0   | 5.0    | 37.9   | 20.0   |
| % < 31 ..  | 0      | 15.0   | 6.9    | 5.0    |

not show such a relationship. (High ZD per cents were arbitrarily taken at about 80 or more and low ZD per cents at about 33 or less.)

#### *The relation between zero differences and co-variation*

Theoretically, it would be possible for R and S scores on a particular symptom to produce no zero differences but to co-vary perfectly over sessions. For example, it would be possible for R's scores always to be lower than S's, while at the same time the two sets of scores covaried perfectly from occasion to occasion. We would thus have an ZD per cent of 0 and a correlation of 1.0. An analysis was carried out to test this idea. For this purpose we had to devise an index of co-variation (IC) which was not distorted by the effects of restricted range, as are the conventional indices such as the product moment correlation coefficient. The formula was as follows:

$$IC = \frac{M - P}{N} \times 100$$

Where M = number of times both estimates show the same direction of change from one occasion to the next, i.e. where they both do not change, both increase, or both decrease

P = Number of times both estimates show change in the opposite direction from one occasion to the next

N = Number of total possible pairs of changes

| Example                               |   |   |   |   |   |   |   |   |   |    |
|---------------------------------------|---|---|---|---|---|---|---|---|---|----|
| Occasions                             | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| S score                               | 4 | 3 | 2 | 2 | 3 | 4 | 3 | 2 | 1 | 1  |
| R score                               | 4 | 4 | 2 | 1 | 3 | 2 | 3 | 3 | 2 | 2  |
| 4-2                                   |   |   |   |   |   |   |   |   |   |    |
| IC = $\frac{4-2}{9} \times 100 = +22$ |   |   |   |   |   |   |   |   |   |    |

We were interested only in symptoms with high degrees of covariation, so we looked for

IC's of +80 or above that did not already have equally high ZD's. We only found one such symptom in all four experiments.

#### DISCUSSION AND CONCLUSIONS

##### *Main findings*

Essentially, we have carried out a series of four experiments upon a single case, the second author. The general theory of single case research (Shapiro, 1966) leads us to expect that the co-variations which have emerged from these experiments would be produced again by at least some of those psychiatrists who resemble FP in experience and outlook, providing of course they worked with similar patients. This applies especially to the co-variation of RS discrepancy with severity. There emerged from these experiments four main results which were replicated on each of the four cases: (i) a high frequency, about 60 per cent, of zero RS differences; (ii) a very high frequency of zero plus 1 point differences (about 90 per cent), contrasting with the low percentages of maximum, three point, differences (0.5 per cent to 8.9 per cent); (iii) a clear tendency for the frequency of zero differences (ZD's) to be related to level of severity, there being greater agreement at the extremes than in the middle of the PQ scale; and (iv) no apparent relationship of per cent of ZD's to symptom content. The main inconsistency was provided by the direction of differences. R tended to overestimate the ratings of Cases 1 and 3 (the former strongly) and to underestimate those of Cases 2 and 4 (the latter strongly). A hint of a possible psychological mechanism is given by the fact that the outcome for Cases 1 and 3 was relatively good and for Cases 2 and 4 relatively bad.

##### *Artifacts*

There were at least six artifacts which could have affected the results, making R's ratings appear to be less or more accurate than they 'really' were.

1. *R's intimate knowledge of each patient.* Contrary to our initial assumption, an unfamiliar R might have perceived S's interview responses with less distortion because of the absence of preformed opinions about S.

2. *S's assessment of the intensity of her symptoms twice on each occasion;* in the PQ test and the interview situation. Resulting psychological processes could have substantially modified the second assessment.

3. *Possible small 'real' psychological differences between mid-points of the PQ scale.* The psychological distance between the 2 and 3 score points on the scale may be much smaller than that between 2 and 1 and between the 3 and 4 points. The combining of these two scale points into one (Table III) did substantially increase the proportion of zero difference to 57 per cent, 51 per cent, 54 per cent and 50 per cent for Cases 1, 2, 3 and 4 respectively. The extremes, however, still produced much higher percentages of zero differences.

4. *Possible low 'ceiling' and/or high 'floor' of the PQ scale.* It is theoretically possible that the extremes of the PQ scale might be nearer to each other than the extremes of the S's 'real' feelings. In such an event both S and R might produce a 4 score when a higher ceiling might for example show R lower than S. Similarly both might produce a 1 score when a lower floor might for example show R as higher than S.

5. *Complexity of R's task.* R tried to take into account S's tendency to underplay or to exaggerate her responses. Perhaps the simple instruction to predict how the patient 'really' felt might have produced more accurate results.

6. *Differences in response conditions.* R obtained verbal responses from S in the face-to-face interview. The PQ responses only required the sorting of cards in the presence of a psychologist who had no direct clinical responsibility for the patient. These conditions alone might have produced the RS differences reported in this paper.

#### CONCLUSIONS

The degree of difference found between R and S responses may not be too great for clinical purposes and may in the end prove to be wholly accountable in terms of the artifacts discussed above. However it would at present seem to be safer when investigating psychological processes to treat the two types of response as distinct sets



of phenomena whose inter-relationships still remain to be established.

Finally, it could be said that the experiments described in this paper really constitute an opening move in the investigation of the process of patient-doctor communication. The understanding and the experimental control of the RS discrepancy could throw light on the nature of this communication process and enable us to improve its accuracy.

#### SUMMARY

Four experiments were carried out upon a psychiatrist's ability to predict the degree of symptom intensity reported by patients. The psychiatrist's predictions were based on interviews with the patient, each of which was conducted either immediately before or immediately after the patient had reported the intensity of his own symptoms in a reproducible and quantifiable manner by means of a personal questionnaire. The psychiatrist gave expression to his predictions by responding to a duplicate questionnaire, the results of which could be compared exactly with the patient's own responses. Each of the four experiments was carried out on a different psychiatric patient, each of whom suffered from a long-term non-

psychotic affective disorder. Each experiment involved between 6 and 17 separate occasions of testing, and each patient was rated on between 20 and 29 symptoms on each occasion. The psychiatrist's predictions were exactly correct about 60 per cent of the time, and were out by one scale point at least another 25 per cent of the time. Discrepancies between psychiatrist and patient did not appear to be related to content but to level of severity, accuracy being greater at the extremes of intensity than in the middle. The results are seen to have implications for research into the nature of psychological disorder and into patient-doctor communication.

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## MMPI and Clinical Scales Compared

By F. G. STEPHENS and M. VALENTINE

### AIMS AND METHODS

The aim of the investigation was to compare rating scales for syndromes as given by a psychological test, the Minnesota Multiphasic Personality Inventory (MMPI), with those derived from a standardized psychiatric history (CAPRICE System). The first is dependent on information supplied directly by the patient, who answers a check-list; the second is based on a psychiatric interview and the completing of a codified case-history. The computerized form of the MMPI was employed (Fowler and Miller, 1969), and the scales selected were those corresponding with manifest anxiety (At scale); depression (D scale); phobias, obsessions and compulsions (Pt scale); and schizophrenia (Sc scale). The nearly corresponding scales derived from the CAPRICE System (Valentine, 1973) are the scales for Anxiety, Depression, Obsessional-Compulsive Disorder, and Psychosis.

In all, data were collected from 70 randomly selected patients who had completed the MMPI and also had a CAPRICE codified case-history. This group of 70 was unselected as regards MMPI validity, including 10 patients whose 'F scores' exceeded a standard score of 80; it was composed of 28 males and 42 females, mean age 33.3 years (S.D. 11.9). The mean male age was 37.5 (S.D. 13.7), the mean female age was 30.3 (S.D. 10.8); 37 were in-patients and 33 were out-patients.

Considering only those patients whose F scores did not exceed 80 and whose records accordingly could be regarded as valid, the total number fell to 60, 25 males and 35 females, mean age 34.8 years (S.D. 12.3). The mean male age was 39.7 (S.D. 13.9) and the mean female age 31.3 (S.D. 11.6); 29 were in-patients and 31 were out-patients.

The diagnoses of this group of 60 patients were made up as follows, the corresponding figures for the group of 70 patients being given

afterwards in brackets—anxiety neurosis 21 (21), depressive neurosis 16 (20), affective and reactive psychoses 11 (11), personality disorder, alcoholism, drug dependence and psychosomatic disorder 7 (8), schizophrenia 4 (7), obsessional neurosis 1 (3).

### RESULTS AND DISCUSSION

In the group of 60 'valid MMPI' cases, there were significant associations of the CAPRICE scales for Depression, Anxiety and Psychosis with the MMPI scales for Depression, Manifest Anxiety and Schizophrenia respectively. The two sets of scales also showed significant associations in the total group of 70 patients, which included 10 MMPI records of doubtful validity because of high F scores; the table indicates the chi-squared values and the significance of these values.

TABLE I  
*Association of the CAPRICE clinical scales with scales derived from the automated MMPI, chi-squared method, 2 degrees of freedom*

| CAPRICE scale                      | MMPI scale | CAPRICE record and unselected MMPI (F score may exceed 80)<br>N = 70<br>$\chi^2$ | CAPRICE record and selected MMPI (F score not more than 80)<br>N = 60<br>$\chi^2$ |
|------------------------------------|------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Depression ..                      | D          | 17.48 **                                                                         | 16.66 **                                                                          |
| Anxiety ..                         | At         | 25.61 **                                                                         | 16.62 **                                                                          |
| Obsessional-compulsive disorder .. | Pt         | 1.46 N.S.                                                                        | 0.57 N.S.                                                                         |
| Psychosis ..                       | Sc         | 13.27 *                                                                          | 9.41 *                                                                            |

\* Significant at  $p < 0.01$  level.

\*\* Significant at  $p < 0.001$  level.

N.S. = Not significant.

Means and standard deviations for these groups, and also for a control group, are available on request.

This suggests that when administered to patients capable of performing it the automated version of the MMPI may be returned as of doubtful validity in about 1 case in 7; however, these MMPI records are not necessarily valueless, though they must be interpreted with care. The 10 cases of doubtful validity were diagnosed as depressive neurosis (4), schizophrenia (3), obsessional neurosis (2) and personality disorder (1). In the sub-group composed of those 10 patients, the same CAPRICE and MMPI scales still showed positive associations, though these were not significant ( $p$  approximately 0.1 by Fisher's Exact Probability Test).

The CAPRICE scale for obsessional-compulsive disorder did not associate significantly with the MMPI Pt scale in the 60-patient, the 70-patient nor the 10-patient groups. Possible reasons are (1) the MMPI Pt scale is not a unitary scale for obsessional and compulsive features; it includes phobias, and indeed many of its items relate to phobic anxiety rather than to obsessional and compulsive disorders; and (2) the CAPRICE scale for obsessional-compulsive disorder has too few items and does not produce a normal distribution.

#### SUMMARY

In a study involving 70 patients who completed the automated MMPI (personality test)

and who also had a standardized psychiatric interview (CAPRICE system), there were significant or highly significant associations between the MMPI scales for Depression, Manifest Anxiety and Schizophrenia, and the nearly equivalent scales derived from the codified psychiatric interview. These associations held good whether the group was formed to include or exclude the encountered one-seventh of MMPI records of doubtful validity because of high F scores. In those records of doubtful validity there were positive but non-significant associations for the same three scales. The MMPI scale for phobias, obsessions and compulsions did not associate significantly with the clinical scale of obsessional-compulsive disorder in any of the groups.

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## Male Admissions to Broadmoor Hospital

By GAVIN TENNENT, KYPROS LOUCAS, GEORGE FENTON and PETER FENWICK

Broadmoor Hospital is one of three Special Hospitals provided for the treatment of patients of 'dangerous or violent propensities', under conditions of security. By definition, it caters for a unique and highly selected group of patients; patients who it is thought are too dangerous to be cared for in more conventional psychiatric facilities. Studies of such selected groups of patients may help us towards a better understanding of the relationship between dangerous behaviour and mental illness. Special groups of patients have been studied (Blackburn, 1970; Le Couteur, 1966; McGrath, 1958), but apart from a general paper by Gould (1957), and a recent research report by Black (1973) remarkably little is known either about the characteristics of those patients who go into hospitals, or about what happens to them after they leave the hospitals.

This paper reports on one of a group of studies which are being undertaken by the Special Hospital Research Unit, to provide a clear picture in this area.

One of the problems of studies such as this is to find other reference groups with which to compare and contrast this highly selected population. In this paper the findings have been related where possible to those of Bearcroft (1966). He studied a group of male patients admitted to Long Grove Hospital, Epsom, over a two year period (1963 and 1964), comparing those who came from courts and prisons (which as they came under Part V of the Mental Health Act, will be referred to as Part V cases) with those who came in from other sources (termed for purpose of this paper as Part IV patients). It has to be recognized, however, that Broadmoor has a national catchment area, compared with the local catchment area of Long Grove.

### METHOD

#### *Selection of subjects*

All male patients admitted to Broadmoor

Hospital between 1.1.70 and 31.3.71 were included in the study.

#### *Sources of information*

For each patient a file was available containing all court reports, probation reports, medical reports, and reports on previous offences. (A study carried out during the course of this survey suggested that information obtained in this way was no less reliable than that obtained from registers, such as the Mental Health Enquiry and the Criminal Records Office). Further information was obtained from any other agency or service with which the patient was known to have been involved, and past case notes were obtained from any previous episodes of hospital care. Selected items, social, criminological and psychiatric, were extracted from these records and entered on to a standard item sheet.

Besides this documentary information, each patient was interviewed independently by two psychiatrists. This interview was in two parts: the first part consisted of a standard psychiatric examination, including an assessment of current mental status, and in the second part the psychiatrist completed Lorr's IMPS (the results of this part of the study will be reported later). A diagnosis by the referring doctor was available in all cases, and a diagnostic formulation was made on the basis of current mental status and past descriptions of mental status by the two examining psychiatrists.

Where it was clinically possible, EEG studies and full psychological assessment were also carried out on all patients (these results are to be reported elsewhere).

### RESULTS

#### *Admissions and re-admissions*

The number of male patients admitted to Broadmoor during the fifteen months of the survey was 178; of these 24 (14 per cent) were

re-admissions. In one case this was the third re-admission, and in three cases the second re-admission. Ten of the re-admissions were recalls of patients in the community, five were transfers from psychiatric hospitals, five transfers from prison, and four came direct from the courts (three for offences of indecent assault, and one for an offence of breaking and entering).

#### *General and social factors*

Some information is given in Table I. Bearcroft does not give a mean age for his groups, but a percentage distribution (with one very wide group (40-59)). However, the Broadmoor admissions appear to be more similar to the Part V than to the Part IV group, and if anything are even younger.

The majority of Broadmoor patients come from the courts. Those coming from psychiatric hospitals are either previous Broadmoor patients who have become too difficult to handle in those

hospitals (5), or patients originally considered fit for ordinary hospital care but who have now become too disturbed to manage. (Nine of these patients were admitted under Section 26 of the Mental Health Act). Those patients admitted from the community are all recalls, presumably because of concern about their behaviour or mental state. Of the two transfers from other Special Hospitals, one was to allow further investigation and the other to make visiting by relatives easier.

Although a high proportion of admissions came from migrant groups, the same is also true for Bearcroft's Part V group.

#### *Legal*

Table II records the different Sections of the 1959 Mental Health Act and of the 1964 Criminal Proceedings (Insanity) Act which were used to detain these patients. All patients in Broadmoor have, of course, to be under some

TABLE I  
*Source of admission, age and ethnic groups*

|                                         |           | Broadmoor<br>(n = 178) |       | Bearcroft            |                     |
|-----------------------------------------|-----------|------------------------|-------|----------------------|---------------------|
|                                         |           |                        |       | Part IV<br>(n = 173) | Part V<br>(n = 177) |
| <i>Source:</i>                          |           |                        |       |                      |                     |
| Courts .. .. .                          | 104       | 58%                    | —     | —                    |                     |
| Prisons and borstals .. .. .            | 38        | 21%                    | —     | —                    |                     |
| Other psychiatric hospitals .. .. .     | 24        | 13%                    | —     | —                    |                     |
| Community .. .. .                       | 10        | 6%                     | —     | —                    |                     |
| Other special hospitals .. .. .         | 2         | 1%                     | —     | —                    |                     |
| <i>Ethnic group:</i>                    |           |                        |       |                      |                     |
| British Isles (including Irish) .. .. . | 140       | 79%                    |       |                      |                     |
| Other European .. .. .                  | 9         |                        |       |                      |                     |
| Asian .. .. .                           | 6         |                        |       |                      |                     |
| Caribbean .. .. .                       | 18        | 21%                    | 12.5% | 27.5%                |                     |
| African .. .. .                         | 4         |                        |       |                      |                     |
| Other .. .. .                           | 1         |                        |       |                      |                     |
| <i>Age:</i>                             |           |                        |       |                      |                     |
| Under 20 .. .. .                        | 10        | 6%                     | —     | —                    |                     |
| 20-29 .. .. .                           | 46        | 26%                    | 28%   | 34%                  |                     |
| 30-39 .. .. .                           | 68        | 38%                    | 18%   | 32%                  |                     |
| 40-59 .. .. .                           | 46        | 26%                    | 42%   | 33%                  |                     |
| Over 60 .. .. .                         | 8         | 4%                     | 12%   | 1%                   |                     |
| <i>Mean:</i>                            |           |                        |       |                      |                     |
| 30.8 years                              | S.D. 11.7 |                        |       |                      |                     |

TABLE II  
*Legal categories*  
*Orders under which patients admitted*

|                                      |              | Number | Per cent |
|--------------------------------------|--------------|--------|----------|
| <i>Detaining orders:</i>             |              |        |          |
| Mental Health Act, 1959              | S.26         | 9      | 5%       |
| Hospital orders                      | .. { S.60    | 10     | 6%       |
|                                      | .. { S.60/65 | 101    | 57%      |
| Prison transfer                      | .. S.72      | 40     | 22%      |
| Transfer on remand                   | S.73         | 5      | 3%       |
| <i>Criminal Proceeding Act, 1964</i> |              |        |          |
| MacNaughton                          | .. ..        | 3      | 2%       |
| Unfit to plead                       | .. ..        | 10     | 6%       |

sort of order. It will be seen that 57 per cent are on Hospital Orders made by courts, with restrictions on discharge. Medical staff at Broadmoor prefer such orders, particularly when made without limit of time (as opposed to Hospital Orders without restrictions), as this allows for longer and better supervision in the community after discharge.

Of the five patients who were transferred to Broadmoor whilst on remand all later returned to the hospital, under Hospital Orders. (These patients have only been included once in the survey.)

#### *Psychiatric features*

Some features of previous and present psychiatric history of the Broadmoor patients are shown in Table III. It will be seen that 67 (38 per cent) had had no previous psychiatric in-patient treatment, and a further 36 (20 per cent) only one previous admission. Whereas in both Bearcroft's groups the majority of patients with previous admissions had been admitted in the preceding twelve month period, this was true for only a very small proportion of the Broadmoor group. Indeed, only 63 (58 per cent) had had their last previous admission in the preceding three years. The mean length of time since last admission, was 8.6 years, though with a very wide range (up to 28 years). Similarly, the length of psychiatric history was very widespread.

#### *Criminological features*

Some features of the past and present criminal history of these patients are shown in Table IV.

Of the Broadmoor group 44 (25 per cent) had had no previous convictions; a proportion very similar to that found in Bearcroft's Part V group. Of those with no previous convictions 30 had crimes of violence as their present offence (four of these were murder and eight of manslaughter). Two of the sex offenders and four of the arsonists had also had no previous conviction. Of those with previous convictions 53 per cent had had convictions for offences involving violence.

In Table V present offence is related to past offences. Violent offenders were more likely to have previously committed an offence of violence, rather than one of a sexual nature or one involving malicious damage or arson ( $p < .001$ ). Those whose offence was arson or malicious damage were more likely to have committed an offence of a similar nature, than a violent offence or a sexual offence ( $p < .05$ ), and sexual offenders were more likely to have committed a previous sexual offence than one of arson or malicious damage ( $p < .05$ ). Property offenders were more likely to have committed a previous property offence than one of any of the other three groups ( $p < .001$ ).

Within the group with present violent offences, it will be apparent that in terms, at least of previous offences, the 'murder/manslaughter' categories differ from the attempted murder and other violence groups. (Many of the manslaughter cases started out as indictments for murder, which were reduced to manslaughter on account of diminished responsibility). If these two major groupings are compared with each other, it can be shown that the attempted murder/other violence group are significantly more likely to have been convicted of a violent offence than the murder/manslaughter group ( $p < .02$ ).

#### *Psychiatric diagnosis and offence*

Table VI shows the relationship between current psychiatric diagnosis (as made by the referring doctor) and current offence. The affective and organic disorders are almost entirely confined to the violent offenders group, but these classifications are a relative rarity in the total group of which the violent offenders

comprise by far the largest proportion (60 per cent).

There were 13 (7 per cent) patients who had had neither a previous conviction nor any previous psychiatric in-patient care. Of the 67 patients with no history of previous psychiatric admissions 46 had a present offence involving violence (6 murder, 12 manslaughter).

In terms of numbers of previous convictions, those diagnosed as schizophrenic—73 (68 per cent)—had an average of 4.2 convictions (if only those with previous convictions are considered, this is 6.3); those diagnosed as psychopathic disorder, an average of 7.1 offences (if only those 44 (86 per cent)) with previous convictions are considered, this is 8.1).

TABLE III  
*Psychiatric diagnoses and previous hospital admissions*

|                                                                 | Broadmoor<br>(n = 178) |                | Bearingcroft         |                     |
|-----------------------------------------------------------------|------------------------|----------------|----------------------|---------------------|
|                                                                 |                        |                | Part IV<br>(n = 173) | Part V<br>(n = 177) |
| Schizophrenia .. .. .                                           | 106 (99)               | 60%            | 33%                  | 56%                 |
| Paranoid state .. .. .                                          | 2 (2)                  | 1%             |                      |                     |
| Manic-depressive psychosis .. .. .                              | 9 (9)                  | 5%             | 13%                  | 7%                  |
| Neurotic disorder .. .. .                                       | 2 (9)                  | 1%             | 28%                  | 15%                 |
| Organic states .. .. .                                          | 8 (8)                  | 4%             | 3%                   | 3%                  |
| Psychopathy .. .. .                                             | 51 (51)                | 29%            | 20%                  | 17%                 |
| Mental subnormality .. .. .                                     | 0                      |                | 2%                   | 1%                  |
| <i>Mental disorder:</i>                                         |                        |                |                      |                     |
| Mental illness .. .. .                                          | 131                    | 74%            |                      |                     |
| Psychopathic disorder .. .. .                                   | 47                     | 26%            |                      |                     |
| (1) No previous psychiatric in-patient treatment .. .. .        | 67                     | 38%            | 25%                  | 24%                 |
| (2) Time since last admission:                                  |                        |                |                      |                     |
| Less than 12 months .. .. .                                     | 16                     | 14%            | 66%                  | 58%                 |
| More than 12 months .. .. .                                     | 95                     | 86%            | 34%                  | 42%                 |
| (3) Mean length of time since last in-patient treatment .. .. . | 8.6 yrs.               | S.D. 7.4 yrs.  |                      |                     |
| (4) Mean age of first psychiatric in-patient treatment .. .. .  | 28.9 yrs.              | S.D. 11.8 yrs. |                      |                     |

TABLE IV  
*Criminological: Convictions and institutional care*

|                                                 | Broadmoor<br>(n = 178) |                | Bearingcroft         |                     |
|-------------------------------------------------|------------------------|----------------|----------------------|---------------------|
|                                                 |                        |                | Part IV<br>(n = 173) | Part V<br>(n = 177) |
| No previous convictions .. .. .                 | 44                     | 25%            | 72%                  | 28%                 |
| <i>Types of previous convictions (n = 134):</i> |                        |                |                      |                     |
| Property offences .. .. .                       | 89                     | 67%            |                      |                     |
| Malicious damage/arson .. .. .                  | 39                     | 29%            |                      |                     |
| Sexual offences .. .. .                         | 28                     | 21%            |                      |                     |
| Non-sexual violence .. .. .                     | 71                     | 53%            |                      |                     |
| Mean age of first offence .. .. .               | 23.0 yrs.              | S.D. 13.7 yrs. |                      |                     |
| <i>Previous institutional care:</i>             |                        |                |                      |                     |
| Children's homes .. .. .                        | 18                     | 10%            |                      |                     |
| Approved schools .. .. .                        | 30                     | 17%            |                      |                     |
| Borstal .. .. .                                 | 40                     | 22%            |                      |                     |
| Prison .. .. .                                  | 82                     | 46%            |                      |                     |



TABLE V  
*Relationship of present to past offences*

| Present offence           | Past offences |          |                               |        |          |
|---------------------------|---------------|----------|-------------------------------|--------|----------|
|                           | Total         | Property | Arson/<br>Malicious<br>damage | Sexual | Violence |
| Murder .. .. .            | 14            | 29%      | 14%                           | 7%     | 48%      |
| Attempted murder .. ..    | 16            | 56%      | 12%                           | 6%     | 62%      |
| Manslaughter .. .. .      | 26            | 31%      | 8%                            | 11%    | 38%      |
| Other violence .. .. .    | 51            | 55%      | 20%                           | 10%    | 65%      |
| All violence .. .. .      | 107           | 46%      | 15%                           | 9%     | 55%      |
| Sexual .. .. .            | 18            | 50%      | 28%                           | 61%    | 44%      |
| Arson/malicious damage .. | 21            | 57%      | 52%                           | 19%    | 19%      |
| Property .. .. .          | 16            | 81%      | 19%                           | 6%     | 44%      |
| No offence .. .. .        | 9             | 22%      | 22%                           | 22%    | 33%      |

TABLE VI  
*Offence and diagnosis*

|                           | Schizo-<br>phrenia | Affective | Neurotic | Organic | Psycho-<br>pathy | Total |
|---------------------------|--------------------|-----------|----------|---------|------------------|-------|
| Murder .. .. .            | 7                  | 1         | —        | 2       | 4                | 14    |
| Attempted murder .. ..    | 12                 | —         | —        | 1       | 3                | 16    |
| Manslaughter .. .. .      | 11                 | 6         | 1        | 2       | 6                | 26    |
| Other violence .. .. .    | 33                 | 1         | —        | 2       | 15               | 51    |
| Sexual .. .. .            | 8                  | —         | 1        | —       | 9                | 18    |
| Arson/malicious damage .. | 13                 | —         | —        | —       | 8                | 21    |
| Property (stealing) .. .. | 13                 | —         | —        | —       | 3                | 16    |
| Other .. .. .             | 5                  | 1         | —        | —       | 1                | 7     |
| No offence .. .. .        | 6                  | —         | —        | 1       | 2                | 9     |
|                           | 108                | 9         | 2        | 8       | 51               | 178   |

All patients were admitted with a diagnostic label relative to the Mental Health Act (a category of mental disorder—viz.—mental illness, subnormality, severe subnormality, or psychopathic disorder), and a diagnostic label as applied by the referring doctor. The two consultants at Broadmoor who examined the patients on admission made a diagnosis on the basis of current and past recorded mental status, in consultation together. The main problems occurred in the diagnosis of schizophrenia. In order to make this diagnosis the two admitting doctors required that at least two of Schneider's first-rank symptoms should be present, either in the current mental status or recorded in past case-notes.

The diagnoses made in this way are those shown in brackets in the table. In subsequent tables, only the referring doctor's diagnosis has been used. There were 14 cases in which the Broadmoor consultants substituted a diagnosis different from that made by the referring

doctor. Eight patients sent in with a diagnosis of schizophrenia were re-classified: two with a diagnosis of psychopathic disorder, one an organic state, two dissociative reactions, one as an adolescent situational reaction, and two as transient situational reactions. Four patients were previously considered to be suffering from psychopathic disorder; two were reclassified to dissociative states, one to affective disorder and one to an organic state.

It will be apparent that there are great similarities between Bearcroft's Part V group and the Broadmoor group. In both the commonest diagnosis is schizophrenia. They differ in an almost complete absence of neurotic disorder in the Broadmoor group, and an excess of psychopathic disorder in the same group (subnormal patients would go to one of the other Special Hospitals).

Of the 67 patients with no previous psychiatric admission, 30 had a diagnosis (by the referring doctor), of schizophrenia; 26 of

psychopathic disorder; 4 organic and 4 affective disorder; 2 were paranoid states and one neurotic disorder.

#### DISCUSSION

One of the principal objectives of this paper is to present previously unavailable information on an unusual and interesting group of patients. Studies of this sort run the risk of either being indigestible masses of facts or tantalisingly inadequate snippets of information, requiring further elaboration. It is hoped that what information is presented in this paper is complete enough to be self-explanatory. Many issues could be discussed at greater length, but this part of the paper will limit itself to only a few of these.

In the early tables, comparisons are made wherever possible between the Broadmoor group and groups of non-offender patients and offender patients previously reported on by Bearcroft. The offender patients in this latter group can perhaps be considered as involving a less serious risk to the community, in that they were not considered to need the conditions of security that a Special Hospital provides. Despite this, the similarities with the offender patient group (and differences from the ordinary non-offender hospital), are striking.

Both the Broadmoor patients and the offender patients group tend to be younger than the non-offender group, which in itself is not surprising, as the older age groups are under-represented in the criminal population in general.

Immigrant groups are over-represented in both the offender patient and Broadmoor patient groups (although slightly less so in the Broadmoor patient group). Nearly all these patients in the Broadmoor group were diagnosed as suffering from schizophrenia, and it may be that this illness, together with cultural assimilation problems, is a factor in their appearance in the criminal population. Six of the Broadmoor patients had great difficulty in speaking any English at all, which, once they had drifted away from their primary family group, must have made survival in the community very difficult.

Again, in both offender patient groups there is a relative excess of schizophrenic illness as

opposed to other diagnoses. Neurotic disorders in particular are not commonly found in criminal populations, especially here in the Broadmoor population (although more commonly in Bearcroft's offender patient population). On the other hand, psychopathic disorders, as might be expected, are more common in Broadmoor patients than in either of the other two groups.

Two major differences between the Broadmoor patients and Bearcroft's offender patients which require some explanation are the greater number of Broadmoor patients with no previous psychiatric treatment and the longer length of time since the Broadmoor patients were last in hospital. Although patients were interviewed, and all previous files consulted, it is very likely that the figures obtained under-represent the actual picture. It is possible that for Bearcroft's group, being a catchment area population, greater accuracy was obtained, so this could partly explain the observed difference. Examination of this group of offenders with no previous psychiatric history indicated that a very high proportion of them, 26 (39 per cent) were diagnosed as having a psychopathic disorder. Attention has already been drawn to the fact that a greater proportion of patients were given this diagnosis in the Broadmoor group, and this may well have contributed to the observed difference. Although Bearcroft gives no breakdown of the offences committed by his offender patient group, it is likely that violent offenders are over-represented in the Broadmoor group. Forty-six (69 per cent) of those with no previous psychiatric history had committed such offences, and this too may contribute to an explanation of the difference between the two groups.

The longer period between last and present admission may in part reflect the background history of the Broadmoor patients. All Broadmoor patients who were admitted on court orders came from the higher courts and had often spent long periods in custody, waiting for their cases to be heard. Twenty one per cent of them had arrived at the hospital after serving sentences in prisons or borstals, and a further 13 per cent had been in other hospitals for varying lengths of time before being sent to

Broadmoor. Despite this, it does appear that for many of the Broadmoor patients there is a very long interval since last psychiatric admission, and this raises the question whether the more serious Broadmoor type offender may in fact differ in this respect from the offender patient found in the conventional hospital. Unfortunately, current data do not permit us to do more than speculate on this, but it is hoped that further studies now in progress may throw some light on this matter.

The relationship of present to past offence is of some interest. Previous studies have suggested that murderers (and we include here cases with a verdict of manslaughter on grounds of diminished responsibility) can be divided into two basic sub-groups: the over-controlled with few previous offences, and the under-controlled with many such offences (Megargee, 1966; Blackburn, 1970). Twenty-seven per cent of the murder/mauslaughter group had had no previous offences. The tendency of violent offenders to have committed previous violent offences has been commented on by Walker *et al.* (1970), and more recently, in respect of the mentally ill offender, by Walker and McCabe (1973).

The same tendency of mentally ill offenders to have been more commonly convicted of similar offences to that of which they are now convicted is found amongst other offender groups.

#### SUMMARY

This paper examines a group of 178 consecutive admissions to Broadmoor Hospital and

compares and contrasts findings, with those of an earlier study on offender patients in an area mental hospital. In the main, there are more similarities than differences between the two offender patient groups; fewer Broadmoor patients had had previous hospital admissions, and there was a longer time interval between this and the last hospital admission for the Broadmoor group. Other information about the Broadmoor patient group is presented and discussed, in particular the tendency for patients to have been involved in similar offences to that leading to the present admission.

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## The Victims of Mentally Disordered Female Offenders

By ELIZABETH PARKER

The study of the victims of violent criminal offences and the study of female criminality are both poorly documented areas which are currently attracting a larger share of attention. Investigations into the relationship between the victim and offender and descriptions of the victims of fatal offences have appeared intermittently over the years (East, 1936; von Hentig, 1948; Wolfgang, 1957; Morris and Blom-Cooper, 1964; Gibson and Klein, 1969), but in most of these cases the information is peripheral to the main interests of the researchers and the studies are confined to victims of homicide. This report describes the victims of mentally disordered violent female offenders who were patients in the Special Hospitals, and includes victims of murder, manslaughter, attempted murder and wounding.

The Special Hospitals from which the sample was drawn are those which the 1959 Mental Health Act defines as being provided for persons who 'require treatment under conditions of special security on account of their dangerous, violent or criminal propensities'.

There are three such hospitals serving England and Wales and occasionally receiving patients from Northern Ireland and some former colonies. The total population is approximately 1,800 men and 650 women. The patients are all compulsorily detained and are referred to the hospitals from a variety of sources: the courts, the prisons, ordinary psychiatric and subnormality hospitals or directly from the community.

There is a lack of information about victims in general and particularly about victims of violent female offenders, and difficulties were therefore experienced in finding suitable comparative data. Because of the highly selective nature of the present sample it was decided generally to confine comparisons to other

British samples. This limited the field to three investigations: *Murder 1957-1968. A Home Office Statistical Division Report on Murder in England and Wales*, by E. Gibson and S. Klein; *Medical Aspects of Crime*, by W. Norwood East, which contains some data on the victims of 200 sane and 300 insane homicides, and lastly *The Criminal and his Victim*, by von Hentig, which quotes some relevant figures for British homicides. These three studies refer only to homicide, and the victims are either victims of male offenders or of male and female offenders combined, the females constituting a very small proportion of the total. Although any comparisons should be treated with caution it is felt that it is of some value to include them.

### THE SAMPLE

This paper is based on the preliminary data from a survey of all the patients admitted to the Special Hospitals during the years 1961-1965 inclusive. Within this period a total of 320 women were admitted; of this number 47 had committed murder, manslaughter, attempted murder or wounding (felonious and malicious) and during the specified five years had been convicted of such by a court and had been committed under a Hospital Order or had been found unfit to plead or not guilty by reason of insanity. Of these 47, the great majority (40) were classified as cases of mental illness or psychopathic disorder; only 6 were subnormal or severely subnormal, and one was unclassified. The small numbers involved precluded any investigation of differences that might have existed between the victims of the different categories of disordered offenders, and so the 55 victims of these 47 women are here considered as a whole.

Table I shows that 35 per cent of all female offenders who committed one of the four

TABLE I

*Offence and legal status of mentally disordered, violent female offenders, 1961-1965*

|                                                                             | Murder (1)     |                          | Manslaughter (4)<br>and<br>infanticide |                          | Attempted<br>murder |                          | Wounding       |                          | Total          |                          | %  |
|-----------------------------------------------------------------------------|----------------|--------------------------|----------------------------------------|--------------------------|---------------------|--------------------------|----------------|--------------------------|----------------|--------------------------|----|
|                                                                             |                |                          |                                        |                          |                     |                          |                |                          | (a)            | (b)                      |    |
|                                                                             | Total<br>women | Admit-<br>ted<br>to S.H. | Total<br>women                         | Admit-<br>ted<br>to S.H. | Total<br>women      | Admit-<br>ted<br>to S.H. | Total<br>women | Admit-<br>ted<br>to S.H. | Total<br>women | Admit-<br>ted<br>to S.H. |    |
| Unfit to plead or<br>not guilty by<br>reason of in-<br>sanity (2) ..        | 12             | 9                        | 3                                      | 2                        | 7                   | 7                        | 4              | 3                        | 26             | 21                       | 81 |
| Hospital order<br>with restriction<br>on discharge<br>(1959 MHA<br>s.65) .. | —              | —                        | 20                                     | 9                        | 6                   | 2                        | 16             | 10                       | 42             | 21                       | 50 |
| Hospital Order<br>(1959 MHA<br>s.60) ..                                     | —              | —                        | 20                                     | 3                        | 6                   | 1                        | 40             | 1                        | 66             | 5                        | 8  |
| Total ..                                                                    | 12             | 9                        | 43 (3)                                 | 14                       | 19                  | 10                       | 60             | 14                       | 134            | 47                       | 35 |

- (1) The penalty for persons convicted of murder is fixed by law as life imprisonment, thus none of the murderers received hospital orders. Persons charged with murder but found 'unfit to plead' or 'not guilty by reason of insanity' have not been convicted of murder and it is the responsibility of the Home Secretary to place such persons in a suitable hospital.
- (2) This nomenclature is in accordance with the Criminal Procedure (Insanity) Act, 1964, which replaced the expression 'insane on arraignment' by 'unfit to plead' and the special verdict of 'guilty but insane' by 'not guilty by reason of insanity'.
- (3) Only one person convicted of infanticide is included in this figure. She was not admitted to the Special Hospitals during 1961-1965.
- (4) Both convictions of manslaughter on the grounds of diminished responsibility and ordinary convictions of manslaughter are included in these columns. Of the 14 persons convicted of manslaughter and admitted to a Special Hospital only 9 could be reliably ascertained as having been convicted of such on the grounds of diminished responsibility.

violent offences specified and who had been found insane or committed under a Hospital Order during 1961-1965 were admitted to a Special Hospital during the same period. However, this proportion varies substantially between the three different disposal groups: just over four-fifths of all the women found 'unfit to plead' or 'not guilty by reason of insanity', but only half of the women placed under Hospital Orders with restrictions on discharge were admitted to a Special Hospital; of women under Hospital Orders without a

restriction on discharge only 8 per cent were admitted. These differing proportions reflect the varying degrees of danger the three disposal groups are felt to present to the public.

The victims who form the subject of this paper are, therefore, the victims of one third of the female offenders who committed murder, manslaughter, attempted murder or wounding and who were found to be insane or were committed under a Hospital Order during 1961-1965. The information concerning them was extracted from case records.

## FINDINGS

*Number of victims and number of aggressors*

Of the 47 aggressors, 39 attacked one victim only and 8 attacked two victims. Thus, out of 47 incidents, 17 per cent resulted in two victims. It is of interest to compare this finding of an excess of victims over aggressors with that of the study of murder in England and Wales by Gibson and Klein, which showed that the proportion of victims to suspects for murder committed by normal offenders differed from that of homicide by persons deemed to be mentally disordered. In the 'normal' group

there were many instances of victims being murdered by more than one suspect, whereas in the 'abnormal' homicides\* the reverse was the case: there were numerous incidents in which one person killed several victims.

\* Gibson and Klein defined 'abnormal' homicides as all homicides (1) where the offender was found to be insane, (2) committed by persons convicted of manslaughter on the grounds of diminished responsibility (Homicide Act, 1967, s.2), (3) committed by persons who later committed suicide. In comparisons between the present study and that of Gibson and Klein, group 3, the murders followed by suicide are omitted so that the discrepancies between the two samples are somewhat reduced.

TABLE II  
*Details of victims*

|                                                   |    |    |    |    | Murder | Man-<br>slaughter | Attempted<br>murder | Wounding | Total |     |
|---------------------------------------------------|----|----|----|----|--------|-------------------|---------------------|----------|-------|-----|
|                                                   |    |    |    |    | n      | n                 | n                   | n        | n     | %   |
| <i>Number of victims and number of aggressors</i> |    |    |    |    |        |                   |                     |          |       |     |
| No. of incidents with one victim                  | .. |    |    |    | 8      | 12                | 10                  | 9        | 19    | 83  |
| No. of incidents with two victims                 | .. |    |    |    | 1      | 2                 | 0                   | 5        | 8     | 17  |
| Total                                             | .. | .. | .. | .. | 9      | 14                | 10                  | 14       | 47    | 100 |
| <i>Relationship of victim to aggressor</i>        |    |    |    |    |        |                   |                     |          |       |     |
| Progeny                                           | .. | .. | .. | .. | 6      | 8                 | 3                   | 2        | 19    | 35  |
| Parent                                            | .. | .. | .. | .. | 1      |                   | 1                   | 3        | 5     | 9   |
| Spouse                                            | .. | .. | .. | .. |        | 2                 | 2                   |          | 4     | 7   |
| Sibling                                           | .. | .. | .. | .. |        | 1                 | 1                   | 2        | 4     | 7   |
| Other relative                                    | .. | .. | .. | .. |        | 1                 |                     | 1        | 2     | 4   |
| Total relatives                                   | .. | .. | .. | .. | 7      | 12                | 7                   | 8        | 34    | 62  |
| Other association                                 | .. | .. | .. | .. | 3      | 3                 | 3                   | 2        | 11    | 20  |
| Stranger                                          | .. | .. | .. | .. |        | 1                 |                     | 9        | 10    | 18  |
| Total                                             | .. | .. | .. | .. | 10     | 16                | 10                  | 19       | 55    | 100 |
| <i>The sex of the victims</i>                     |    |    |    |    |        |                   |                     |          |       |     |
| Male                                              | .. | .. | .. | .. | 5      | 8                 | 8                   | 12       | 33    | 60  |
| Female                                            | .. | .. | .. | .. | 5      | 8                 | 2                   | 7        | 22    | 40  |
| Total                                             | .. | .. | .. | .. | 10     | 16                | 10                  | 19       | 55    | 100 |
| <i>The ages of the victims</i>                    |    |    |    |    |        |                   |                     |          |       |     |
| Under 16                                          | .. | .. | .. | .. | 6      | 10                | 3                   | 2        | 21    | 38  |
| 16 but under 50                                   | .. | .. | .. | .. |        | 2                 | 3                   | 6        | 11    | 20  |
| Over 50                                           | .. | .. | .. | .. | 2      | 2                 | 3                   | 4        | 11    | 20  |
| Not known but adult                               | .. | .. | .. | .. | 2      | 2                 | 1                   | 7        | 12    | 22  |
| Total                                             | .. | .. | .. | .. | 10     | 16                | 10                  | 19       | 55    | 100 |

\*

N.S.

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TABLE II (continued)  
*Details of victims*

|                                    |    |    |    | Murder | Man-<br>slaughter | Attempted<br>murder | Wounding | Total |     |     |
|------------------------------------|----|----|----|--------|-------------------|---------------------|----------|-------|-----|-----|
|                                    |    |    |    | n      | n                 | n                   | n        | n     | %   |     |
| <i>The time of the offence</i>     |    |    |    |        |                   |                     |          |       |     |     |
| 8.0 a.m. but before midday         | .. | .. | .. | 7      | 7                 | 4                   | 3        | 21    | 42  |     |
| Midday but before 4.0 p.m.         | .. | .. | .. | 0      | 5                 | 1                   | 7        | 13    | 26  |     |
| 4.0 p.m. but before midnight       | .. | .. | .. | 1      | 2                 | 1                   | 6        | 10    | 20  |     |
| Midnight but before 8.0 a.m.       | .. | .. | .. | 1      | 1                 | 3                   | 1        | 6     | 12  |     |
| Not known                          | .. | .. | .. | 1      | 1                 | 1                   | 2        | 5     |     |     |
| Total                              | .. | .. | .. | 10     | 16                | 10                  | 19       | 55    | 100 |     |
| <i>Location of offence</i>         |    |    |    |        |                   |                     |          |       |     |     |
| Home of victim and offender        | .. | .. | .. | 7      | 12                | 6                   | 6        | 31    | 56  |     |
| Home of victim but not offender    | .. | .. | .. |        | 2                 |                     | 1        | 3     | 6   |     |
| Home of offender but not of victim | .. | .. | .. | 1      |                   |                     | 2        | 3     | 6   |     |
| Total domestic setting             | .. | .. | .. | 8      | 14                | 6                   | 9        | 37    | 67  |     |
| Public place                       | .. | .. | .. |        | 1                 | 1                   | 8        | 10    | 18  |     |
| Psychiatric hospital               | .. | .. | .. | 2      | 1                 | 1                   |          | 4     | 7   |     |
| Victim's place of work             | .. | .. | .. |        |                   | 1                   | 2        | 3     | 6   |     |
| Other                              | .. | .. | .. |        |                   | 1                   |          | 1     | 2   |     |
| Total                              | .. | .. | .. | 10     | 16                | 10                  | 19       | 55    | 100 | **  |
| <i>Method of attack</i>            |    |    |    |        |                   |                     |          |       |     |     |
| Sharp instrument                   | .. | .. | .. | 1      | 2                 | 6                   | 8        | 17    | 31  |     |
| Strangulation                      | .. | .. | .. | 6      | 6                 | 1                   |          | 13    | 24  |     |
| Punched, kicked or pushed          | .. | .. | .. |        | 2                 |                     | 4        | 6     | 11  |     |
| Firearms                           | .. | .. | .. |        | 2                 |                     | 2        | 4     | 7   |     |
| Gas poisoning                      | .. | .. | .. |        | 1                 | 2                   | 1        | 4     | 7   |     |
| Boiling water                      | .. | .. | .. | 2      |                   | 1                   | 1        | 4     | 7   |     |
| Blunt instrument                   | .. | .. | .. | 1      | 2                 |                     | 1        | 4     | 7   |     |
| Other                              | .. | .. | .. |        | 1                 |                     | 2        | 3     | 6   |     |
| Total                              | .. | .. | .. | 10     | 16                | 10                  | 19       | 55    | 100 | *** |

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ 

The chi-square test was used in all calculations of significance. The fatal offences were compared with the non-fatal offences for all items except the Relationship of the Victim to the Aggressor where the victims of wounding were compared with the remainder.

With regard to homicide, the finding of the present study corresponds with that of Gibson and Klein, but also suggests that there may be more victims than aggressors for non-fatal violent offences against the person, particularly wounding, committed by mentally disordered female offenders.

#### *Relationship between the victim and aggressor*

The finding that a substantial proportion of the victims of murder, 70 per cent, and manslaughter, 75 per cent, were related to their

assailants seems to be characteristic of studies of homicides by mentally abnormal persons. Gibson and Klein found that 49 per cent of the victims of 'abnormal' homicides were killed by their relatives, compared with only 31 per cent of the victims of 'normal' homicides. The corresponding figures derived from East's study of homicide victims are 54 and 32 per cent respectively.

Consideration of the offence groups shows that the victims of murder, manslaughter and attempted murder have very similar proportions



of those who were related to their attackers, the figures ranging between 70 and 75 per cent. Another resemblance between these three groups is that only one victim of manslaughter and none of the victims of murder or attempted murder were attacked by strangers. The victims of wounding differ in that only 42 per cent were related to their aggressors and 47 per cent were attacked by apparent strangers.

#### *The sex of the victim*

Fifty-nine per cent of the victims were male and 41 per cent female. Within the offence groups, the two sexes are almost equally represented with regard to murder and manslaughter, but the victims of attempted murder and wounding contain a preponderance of males. Gibson and Klein found that only 34 per cent of the victims of 'abnormal' homicide were males, but for 'normal' murders the figure rose to 45 per cent. These figures, therefore, do not seem to be similar to those of the present study.

#### *The age of the victim*

The victims' ages can most conveniently be considered as falling into five parts. The largest group were those under 16 years of age, who constituted nearly two-fifths of the sample. A further fifth fell into the over 16 under 50 range, and another fifth were over 50 years of age. The ages of the last fifth were unknown, but all the cases could be positively identified as adults.

Most of the victims of the fatal offences were under 16 years of age, but the majority of the victims of attempted murder and wounding were adults. This finding suggests the hypothesis that those least able to defend themselves on account of their age are more likely to be killed than those who can protect themselves by reason of a greater degree of physical strength. This was tested by calculating, for the fatal and non-fatal offences separately, the proportion of victims who were either less than 10 years old or 70 years of age or more.\*

\* In order to increase the number of individuals included in the calculation the dozen adults whose age was unknown were inspected in order to assess if any of them could be reasonably placed in the vulnerable age category. Only one, the mother of a 43-year-old offender, was placed in the over-70 group. A further 7 victims were placed in the non-vulnerable age group; these were the

The figures in Table III support the hypothesis: 17 victims, 71 per cent, of the fatal offences, but only 8 victims, 30 per cent, of the non-fatal offences were in the vulnerable age group.

TABLE III  
*Proportion of very young and very old victims*

|                            | Fatal offences | Non-fatal offences | Total |
|----------------------------|----------------|--------------------|-------|
| Under 10 and over 70 years | 17             | 8                  | 25    |
| Other ages ..              | 7              | 19                 | 26    |
| Total ..                   | 24             | 27                 | 51    |

$$\chi^2 = 8.8; \text{d.f.} = 1; p < .005$$

Comparisons with Gibson and Klein can only be made for victims of fatal offences aged less than 16 years. In their study this age group constituted 29 per cent of the victims of 'abnormal' homicides and 21 per cent of the victims of 'normal' murder. Thus there appears to be an increasing progression from 'normal' murder to 'abnormal' homicide and from this to homicide by mentally disordered dangerous female offenders in the proportion of victims aged under 16 years.

#### *The time of the offences*

Classification of the time of the offences presented difficulties: some reports stated the exact time, others mentioned a specific period, and some just stated 'morning' or 'afternoon'. The classification eventually chosen is shown in Table II; the 8 a.m. to midday period includes 5 victims said to have been attacked in the morning, 3 victims who were attacked in the afternoon are included in the midday to 4 p.m. period, and 1 victim who was attacked in the evening appears in the 4 p.m. to midnight category.

spouse of a 20-year-old offender, two victims described in the police report as 'young men', the son-in-law of a 40-year-old offender, two bailiffs and a police constable. It was not possible to determine the likely age of four of the victims, two fellow patients, a landlady and a customer in a shop, and they were omitted from the calculation.

Of the victims for whom the time of offence was known, 42 per cent were attacked in the morning between 8 a.m. and midday, for 26 per cent the offence occurred between midday and 4 p.m. and for another 20 per cent between 4 p.m. and midnight. Only 12 per cent were attacked between midnight and 8 a.m.

Von Hentig quotes the time of day of murders committed in Great Britain during 1901-1905. These figures are very different from those of the present study in that 56 per cent of the murders were committed between 4 p.m. and midnight and a further 18 per cent between midnight and 8 a.m. Only 11 per cent were committed between 8 a.m. and midday, the most popular period in the present study, and 15 per cent between midday and 4 p.m. Wolfgang, in his study of homicides in Philadelphia, also found that the night hours were the most dangerous, and considers 8 p.m. to 2 a.m. as being the most lethal period. The figures quoted by von Hentig and Wolfgang are for unselected samples consisting of both mentally normal and mentally abnormal homicides, whereas the present study is based solely on mentally abnormal female offenders. 'Mental abnormality' covers a variety of psychiatric disorders including depression, and two of the characteristics of endogenous depression are that it tends to be most acute on waking and during the morning and that persons suffering from it tend to wake very early. Severe depression is also associated with aggressive attacks directed by the sufferer either towards himself or towards other persons, particularly members of his family. Therefore, it is hypothesized that for offences committed between midnight and midday there will be a higher proportion of women offenders with a diagnosis of depression than for offences committed at other times.

The figures in Table IV support the hypothesis: over 50 per cent of the offenders who committed an offence between midnight and midday were diagnosed as suffering from depression, compared with 30 per cent of the women who offended between midday and 4 p.m., and only 13 per cent who offended after 4 p.m. but before midnight.

Considering the times the different types of offence were committed, it is seen that murder,

TABLE IV  
*Proportion of female offenders diagnosed as depressive by time of offence*

| Time of offence               | Proportion | %  |
|-------------------------------|------------|----|
| 8 a.m. but before midday ..   | 10/19      | 53 |
| Midday but before 4 p.m. ..   | 3/10       | 30 |
| 4 p.m. but before midnight .. | 1/8        | 13 |
| Midnight but before 8 a.m. .. | 3/6        | 50 |
| Not known .. .. .             | 1/4        | 25 |

manslaughter and attempted murder are similar in that the largest single group of victims were attacked between 8 a.m. and midday, but the modal category for wounding is from midday to 4 p.m. An association between time of offence and a diagnosis of depression in the offender has already been demonstrated for the total sample. It is now hypothesized that the different temporal pattern of the wounding offences, in particular the smaller proportion of offences occurring between midnight and midday, is associated with a smaller proportion of offenders diagnosed as depressive.

Table V shows that the hypothesis is confirmed: none of the offenders who wounded

TABLE V  
*Proportion of female offenders diagnosed as depressive by type of offence*

|            | Murder | Man-slaughter | Attempted murder | Wounding |
|------------|--------|---------------|------------------|----------|
| Proportion | 4/9    | 10/14         | 4/10             | 0/14     |
| Per cent   | 45     | 71            | 40               | —        |

had a diagnosis of depression, whereas the proportions for murder, manslaughter and attempted murder were 45, 71 and 40 per cent respectively.

Thus, the time of day when the victims of the present study were attacked may to some extent be explained in terms of the psychiatric disorder of their assailants. However, it is possible that this interpretation may be tautologous in that it is not known how far the time of the offence influenced the making of a diagnosis of depression.

#### *The location of the offence*

A total of two-thirds of the victims, 67 per cent, were attacked in a domestic setting. This

complements the previous finding that 62 per cent of the victims were related to their assailants. Eighteen per cent of the victims were attacked in a public place, 7 per cent in psychiatric hospitals, 6 per cent at their places of work and 2 per cent in some other place. Comparison of the fatal and non-fatal offences shows that more of the victims of the latter group were attacked outside the home.

#### *The method of attack*

The victims of the fatal and non-fatal offences showed marked differences in the method by which they had been attacked: the greatest single proportion of victims of both murder and manslaughter were strangled, but the most popular method for attempted murder and wounding was attack with a sharp instrument.

Comparison of the fatal offences of the present study with Gibson and Klein's 'abnormal' homicides shows that strangulation is the most popular method for both groups, but the proportions are not similar, being 46 per cent and 28 per cent respectively. The most popular method of attack for Gibson and Klein's 'normal' homicides is by means of a sharp instrument, 31 per cent, and strangulation is the second most favoured method, 26 per cent.

Only four of the victims in the present study appear to have suffered from more than one type of assault. In two of the cases of asphyxia there was some suggestion that poison (aspirin and rat poison) had been administered. One of the victims of gas poisoning also suffered superficial injuries caused by a spade, and one of the victims who had boiling water poured over him was also attacked with a billhook.

#### *The circumstances of the offences*

The information covering the circumstances of the offences was obtained from the case notes, particularly the police reports. It is possible that these reports could be incomplete or one-sided when describing the attacks and it is with this reservation that the following findings are presented.

For five of the victims the circumstances of the offences were not known. For the remaining 50 victims, the attack appeared to have been completely unexpected in 32 instances. Nine

of the victims were known to have been previously attacked or threatened by their assailants, or there had been a history of discord between them. For the remaining nine victims it was possible to identify specific events in the lives of their seven assailants which could be interpreted as factors precipitating the attacks. Two of the offenders committed their offences under threat of eviction from their homes, one attempting to gas her child the day before her tenancy expired and the other attacking two bailiffs who came to evict her. Arguments immediately preceded the attacks in two cases; in one the offender had an altercation with her husband and subsequently tried to gas him, in the other case, the offender had an argument with her cohabitee and then killed his child. The mental state of two of the offenders had reached a critical point; the doctor had visited one offender to stress the necessity of her receiving in-patient psychiatric treatment and had made arrangements for her to enter hospital the following day—early the next morning she killed her son. The other offender had been diagnosed by her doctor as depressed six days after the birth of her son and her family were warned not to leave her alone—eleven days later she killed both her children. In the seventh case the offender had for some time suffered from mental illness and on the day of the attack her husband told her that he had finally decided to divorce her; later in the day the surveyor telephoned about the sale of the house—that evening the offender drowned one of her daughters.

In none of the cases did the victim provoke the attack as defined by Wolfgang, that is, none of the victims was the first to strike a blow.

Although the majority of the victims were attacked unexpectedly, 34 out of the 40 offenders for whom information was available had a history of psychiatric illness and 9 of them were also known to be assaultive.

#### DISCUSSION

The findings of this study show that the victims of the present sample of mentally disordered violent female offenders were predominately a young group, nearly two-fifths being under 16 years of age, who tended to be

related to their assailants (62 per cent), the male victims outnumbering the female victims by three to two. Sixty-seven per cent of the offences took place in a domestic setting, two-fifths occurring between 8 a.m. and midday, and just over half of the sample were attacked by means of a sharp instrument or strangled. The majority of the attacks were completely unexpected; specific stress factors could be identified in nine of the cases and a further nine victims were known to have been previously threatened or attacked by their assailants or there had been a history of discord between them. None of the attacks appeared to have been provoked by the victims.

The findings for the total sample obscure differences which exist between the victims of the four types of offence. The victims of the two fatal offences, murder and manslaughter, tended to be similar to each other, as did the victims of the non-fatal offences of attempted murder and wounding. There was a smaller proportion of very young and very old victims among the non-fatal offences, which suggests that the lesser vulnerability of this group was one of the reasons why the offences were non-fatal. In conjunction with this point, the method of attack is relevant: nearly half of the victims of fatal offences were strangled, but attack with a sharp instrument was the most favoured method for the non-fatal offences. There was also a greater proportion of male victims among the non-fatal offences, but this was not statistically significant.

The fatality rates of the various methods of attack are unknown, but the combined effects of the decreased vulnerability in terms of age, the greater proportion of males and the method of attack might be responsible for the non-fatal offences not proving to be lethal. A greater proportion of the fatal offences compared with the non-fatal offences occurred in a domestic setting, but the significance of this is unclear, particularly as the home was the most popular location for all four types of offence. One finding which cuts across the fatal/non-fatal dichotomy is that concerning the relationship between the victims and their assailants; murder, manslaughter and attempted murder were similar in that most of their victims were related to their

attackers, but the proportion for wounding was under half. The largest single proportion of the victims of wounding were attacked by strangers, compared with only one victim of the three other offences.

The highly selective nature of the sample, together with the absence of any other information relating to the victims of mentally abnormal violent female offenders, makes it difficult to assess the findings of the present study. Comparisons with other studies are in any case restricted to the fatal offences, as there are no British studies of the victims of attempted murder and wounding.

Differences between the findings of the present study and those of other studies with regard to homicide victims could be due to such a variety of factors that any comment must be merely speculative. However, any similarities could indicate that the results are more generally applicable because they are comparable with those of other studies in spite of sampling differences. Application of this concept reveals that out of the eight parameters investigated there was no relevant comparable material for two of the factors and the findings for another two were at variance with those of other studies. One of these items is the proportion of male homicide victims in the sample, which is greater than the proportion found by Gibson and Klein among the victims of 'abnormal' homicide, and is more akin to the figure for 'normal' homicide. The second factor for which the findings did not agree with those of other studies was the time of day the offence was committed. Just over half of the victims of homicide were killed between 8 a.m. and midday, whereas in von Hentig's study of murder in Britain during 1901-1905 most of the offences occurred between 4 p.m. and midnight. The time of all the attacks in the present study has been shown to be related to a diagnosis of depression in the offender, but this does not wholly account for the discrepancy between the present findings and von Hentig's; even when the depressives are omitted the most popular time for attack is still between 8 a.m. and midday. As stated earlier, the non-comparability of the samples precludes further comment.

Two of the factors investigated, the victims' ages and their relationship with their assailants, showed an interesting increasing proportion in three groups of victims, those of 'normal' homicide, 'abnormal' homicide and the victims of the present study. For both these factors the relevant proportions in the present study are higher than for the comparable studies, and it may be that mentally disordered female offenders are more likely to kill a younger person and someone who is related to them than are mentally abnormal offenders generally. Alternatively, the presence of these two factors could increase the chances of a mentally disordered female offender being admitted to a Special Hospital.

The homicide victims of the present study and of Gibson and Klein's 'abnormal' homicides were also similar in that in both groups there were more victims than offenders and the most popular method of attack was by strangulation. In contrast, the victims of 'normal' homicide were outnumbered by their assailants and the most popular method of attack was by means of a sharp instrument. A greater number of victims than aggressors and attack by strangulation are therefore characteristic of both groups of mentally abnormal homicides.

In four of the eight topics investigated some measure of agreement with the findings of other studies of homicide has been demonstrated despite sampling differences. This suggests that these results may be applicable beyond the present sample to all mentally abnormal violent female homicides and possibly to mentally abnormal homicides generally. Further information about victims, particularly the victims of attempted murder and wounding, is required in order to adequately chart the idiosyncrasies of the present sample of victims.

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## Predicting Offender-Patients' Reconvictions

By CLIVE PAYNE, SARAH McCABE and NIGEL WALKER

In 1963-4 the Oxford University Penal Research Unit managed to collect information about 90 per cent of the offender-patients who were admitted to N.H.S. and Special Hospitals under hospital orders made by criminal courts: this cohort has been described in *Crime and Insanity*, Vol. II, by Walker and McCabe (1973). One of the by-products of the follow-up of these offender-patients was a rough and ready scoring system for predicting reconvictions (within a two-year follow-up) of 456 offender-patients who were allowed to leave hospital within a year of admission. A prediction system can be used to assist human decision-making (though it should not be a substitute for it)\* and can also be used to assess the efficacy of measures—such as after-care—by seeing whether individuals with equal predicted reconviction-rates do better with than without the measure (Mannheim and Wilkins, 1955).†

Mr. Payne was interested in finding out whether a more sophisticated prediction formula could be devised by using the logistic method described by Dyke and Patterson (1952), with improvements suggested by Theil (1970) and Goodman (1972). The method is specially designed for examining the effects of a number of independent qualitative variables upon a criterion variable which is expressed as a proportion and has certain technical advantages over more traditional methods, as explained by Cox (1970).

The original sample of 456 'first-year leavers' was refined by excluding:

- (i) a few elderly 'first-timers'; that is, a rather unusual group aged 41 or older

\* The logic and ethics of following or disregarding predicted probabilities in decision-making are discussed by Walker (1971).

† Used in this way it amounts to a sophisticated matching technique.

with no previous known convictions or hospital admissions;

- (ii) another rather unusual group consisting of a few women with previous prison or borstal experience totalling 19 months or more; it had already been observed that they had an extremely high probability of reconviction, and their inclusion might have been the explanation of Walker and McCabe's finding that, unlike virtually all 'penal' samples, the first-year leavers showed no tendency for women to have lower reconviction-rates;
- (iii) offender-patients who had achieved legal freedom by absconding for the necessary period. If a prediction formula is to assist in deciding when to discharge a patient or whether to make arrangements for after-care there is no point in including patients who do not wait for such decisions!

This left 334 first-year leavers. They included, however, 82 men and women who had been readmitted to hospital voluntarily or compulsorily during the two-year follow-up *without being reconvicted first*. If included they would lead to the counting as 'not reconvicted' of some individuals who *would* have been reconvicted but for their admission, and would thus weaken the predictive efficiency of the model. On the other hand, re-admission without reconviction should normally be regarded as a better outcome than reconviction, whether or not followed by re-admission. The final calculations were therefore performed twice, including and excluding this group, with interesting results (see below).

The independent variables taken into account had been chosen as being: (i) more or less 'hard' (although diagnoses are to some extent 'soft'); (ii) of the kind likely to be known to or easily

ascertainable by psychiatrists before they have to take the decision to discharge or make special efforts to arrange after-care. For example, previous convictions were used in preference to 'months in previous penal custody' because the former can be ascertained from the police, whereas the latter involves calculation and sometimes special inquiry. It can be said right away that, as with ordinary penal samples, this variable proved the most powerful predictor. As Table I shows, if a first year leaver had been convicted before the offence which led to his hospital order his chances of being convicted yet again during the two years after discharge were at least twice his chances if he had had a clean record; and if he had six or more previous convictions his chances were four times as great.

The next most powerful was the type of 'current' offence, i.e. the one which had led to the hospital order. If the offence had involved dishonesty—whether by theft, fraud, burglary or robbery—the offender-patient's probability of reconviction was two and a half times greater than if it had been of some other kind (e.g. violence, sexual molestation, vagrancy, public disturbance). This was interesting, because the original beta-coefficient analysis had suggested that the type of current offence was only weakly associated with reconviction (Walker and McCabe, *op. cit.*).

A rather poor third was the diagnostic grouping. For this purpose it was found best to form

three groups\*: (i) all diagnoses in which the predominant disorder had been labelled 'schizophrenic'; (ii) all in which subnormality, psychopathic disorder or its equivalents had been the main element; (iii) all other diagnoses, mostly involving affective labels. The schizophrenic offender-patients had the lowest probability of reconviction, the subnormal or psychopathic the highest. But when those who had been re-admitted to hospital without reconviction were excluded, the diagnosis ceased to be a significant predictor, largely because schizophrenics were strongly represented in the excluded group. In other words, schizophrenics' probabilities of reconviction are lowest largely because they tend to be re-admitted either before committing another offence or without being prosecuted for it.

On the other hand, excluding this group *improved* the predictive power of the logistic model even more than had been expected. Walker and McCabe, relying largely on a beta-coefficient analysis, had estimated that the 'predictability' of reconvictions amongst first-year leavers was only moderate ( $R^2 = 0.26$  for

\* For the purposes of the logistic method it is advisable to use fairly coarse groupings of the variables, since this leads to more stable estimates of the observed cell proportions (see Table II). Thus previous convictions were subdivided into Nil/1-5/6+, types of current offence into dishonest/other, diagnostic group into schizophrenic/subnormal or psychopathic/other. Trials showed that other or more numerous sub-divisions would not have improved the model.

TABLE I  
*Ratios between reconviction probabilities ("pr")*

| <i>If the first-year leaver had</i>           | <i>his pr was</i>           | <i>If the first-year leaver had</i>                    |
|-----------------------------------------------|-----------------------------|--------------------------------------------------------|
| 1-5 previous convictions                      | $1.9 \times \text{the } pr$ | no previous convictions                                |
| 6+ previous convictions                       | $3.9 \times \text{the } pr$ | no previous convictions                                |
| 6+ previous convictions                       | $2.0 \times \text{the } pr$ | 1-5 previous convictions                               |
| been admitted for a dishonest current offence | $2.6 \times \text{the } pr$ | been admitted for a current offence of some other kind |
| been diagnosed as subnormal or psychopathic   | $2.0 \times \text{the } pr$ | been diagnosed as schizophrenic                        |
| been diagnosed as affective etc.              | $1.4 \times \text{the } pr$ | been diagnosed as schizophrenic                        |
| been diagnosed as subnormal or psychopathic   | $1.3 \times \text{the } pr$ | been diagnosed as affective, etc.                      |



men, 0.45 for women).<sup>\*</sup> With the logistic model, however, the predictability was strikingly high ( $R^2 = 0.74$ )<sup>\*</sup> and even higher when the 'merely re-admitted' group were excluded ( $R^2 = 0.83$ ).<sup>\*</sup>

It is important to note that the ratios between the respective probabilities of reconviction seem to be more or less independent of each other. For example, the ratios for numbers of previous convictions are more or less the same whatever the type of current offence and whatever the diagnosis, and *vice versa*. Sometimes it is necessary to construct a model so as to take into account interactive relationships, in which the size of the ratios varies with the other important variables. In this case, however, a simple 'addi-

tive' model proved adequate to describe the relationships.

Table II shows the success with which this simple additive model discriminates if all three variables (previous convictions, type of current offence and diagnosis) are used in combination. It subdivides the 334 first-year leavers into 18 categories, in which substantial percentages of the sample have reconviction-probabilities as different as 25 per cent or less at one extreme and 70 per cent or more at the other. This 'polarization' of a substantial fraction of the sample is one indication of the success of the model. Another is the goodness of fit between the actual (unbracketed) reconviction percentages of each category and those which the model predicts (in brackets). The predicted and actual reconviction percentages are gratifyingly close, especially where schizophrenics and subnormals or psychopaths are concerned.

<sup>\*</sup>  $R^2$  does not mean quite the same thing when derived from beta-coefficients and from a logistic model, but it gives a rough indication of the improvement (see Goodman, 1972).

TABLE II  
*Reconviction percentages of first-year leavers†*

| Convictions<br>previous to<br>hospital<br>order | Type of<br>offence<br>leading to<br>hospital order | Predominant<br>diagnosis  | Percentages reconvicted<br>within two years of leaving<br>(% predicted by logistic<br>model in brackets) | Numbers<br>(=100%) |
|-------------------------------------------------|----------------------------------------------------|---------------------------|----------------------------------------------------------------------------------------------------------|--------------------|
| None                                            | Dishonest                                          | Schizophrenic             | 25.0 (28.4)                                                                                              | 8                  |
|                                                 |                                                    | Subnormal of psychopathic | 70.0 (43.6)                                                                                              | 10                 |
|                                                 |                                                    | Affective or other        | 0.0 (36.5)                                                                                               | 3                  |
|                                                 | Other                                              | Schizophrenic             | 13.3 (13.0)                                                                                              | 45                 |
|                                                 |                                                    | Subnormal or psychopathic | 25.0 (22.7)                                                                                              | 20                 |
|                                                 |                                                    | Affective or other        | 0.0 (17.9)                                                                                               | 11                 |
| 1-5                                             | Dishonest                                          | Schizophrenic             | 41.7 (43.1)                                                                                              | 24                 |
|                                                 |                                                    | Subnormal or psychopathic | 50.0 (59.7)                                                                                              | 22                 |
|                                                 |                                                    | Affective or other        | 42.9 (52.4)                                                                                              | 7                  |
|                                                 | Other                                              | Schizophrenic             | 24.1 (22.4)                                                                                              | 58                 |
|                                                 |                                                    | Subnormal or psychopathic | 35.3 (36.0)                                                                                              | 34                 |
|                                                 |                                                    | Affective or other        | 42.1 (29.5)                                                                                              | 19                 |
| More than 5                                     | Dishonest                                          | Schizophrenic             | 75.0 (60.5)                                                                                              | 16                 |
|                                                 |                                                    | Subnormal or psychopathic | 70.0 (75.0)                                                                                              | 10                 |
|                                                 |                                                    | Affective or other        | 69.2 (69.0)                                                                                              | 13                 |
|                                                 | Other                                              | Schizophrenic             | 25.0 (36.8)                                                                                              | 24                 |
|                                                 |                                                    | Subnormal or psychopathic | 50.0 (53.2)                                                                                              | 6                  |
|                                                 |                                                    | Affective or other        | 75.0 (45.9)                                                                                              | 4                  |
|                                                 |                                                    |                           |                                                                                                          | 334                |

† Excluding the categories described in the text.

The residual category of other diagnoses suffered both from heterogeneity and from smaller numbers. Thus, so far as schizophrenics, subnormals and psychopaths are concerned, a very simple predictive formula seems a real possibility.

Several points must be made, however. In the first place, the model is better at picking out low-risk groups than high-risk groups: 134 out of the 334 in the sample fell into sub-divisions with a 25 per cent or lower reconviction-probability, whereas only 10 had probabilities of 75 per cent (these were all subnormal or psychopathic individuals with dishonest current offences and six or more previous convictions). The remaining 190 fell into categories with middle-range probabilities: a phenomenon which seems to be shared by all penal samples (Simon, 1971). As a means, therefore, of identifying individuals whose discharge might be delayed prediction methods are unlikely to be of much use. But the decision to discharge is not the only one within the hospital's power: the effort to arrange after-care is equally important. Walker and McCabe's finding that efforts at after-care made a significant difference to reconviction-rates was unambiguously confirmed by this analysis, and proved true of even the high-risk groups. A table of this kind can therefore be used as a rational basis for selecting individuals for after-care where resources make it impossible to provide this for all.

On the other hand, as a prediction formula the logistic model, like Walker and McCabe's original scoring system, has still to be validated on another sample of first-year leavers. (It was tried on Walker and McCabe's sample of *second-year* leavers, but was much less powerful in this case, because these were clearly drawn from a population with different characteristics: they included markedly more young patients, subnormals, dishonest offenders and offenders previous convictions.) The authors will be glad to supply further information to anyone who is in a position to attempt a validation.

Finally, the variables which did *not* prove useful predictors must be mentioned. Surprisingly, neither sex nor age did, although in ordinary penal samples being male and being

young are strongly associated with reconviction. Other variables which were also useless as predictors were previous hospital admissions, time at liberty before the current offence, number of short-term jobs, and whether the individual was an immigrant or not. A composite variable—whether employed and/or living at home at the time of the current offence—had some predictive value when applied to individuals with no previous convictions: this was the only definite interactive relationship observed. Some of these variables, however, might well prove useful predictors of re-admission to hospital, which is certainly associated with the number of previous admissions. Our concern in this paper, however, has been with the prediction of reconviction, since our sample consisted of patients admitted as a result of convictions.

#### SUMMARY AND DISCUSSION

A logistic analysis of Walker and McCabe's follow-up data for hospital order patients who are allowed to leave within a year of admission suggests a simple prediction model which is promising enough to call for validation on similar samples. As with ordinary penal samples, the number of previous convictions and type of current offence are powerful predictors of reconviction, but a puzzling difference from ordinary penal samples is the negligible predictive power of sex and age. The diagnosis is a useful predictor only if those patients who are re-admitted without being reconvicted are included in the sample. The probable explanation of these findings is: (i) that hospital orders are used to deal with patients whose 'way of life' involves frequent petty dishonesties, either because they have been reduced to it by their handicaps or because they belong to a subculture in which dishonest acquisition is not strongly disapproved of; and (ii) that the schizophrenic hospital order case has a greater chance than others of being re-admitted to hospital either before he gets into further trouble with the law or without prosecution when he does. The analysis confirms the importance of efforts to arrange after-care, especially for high-risk groups.

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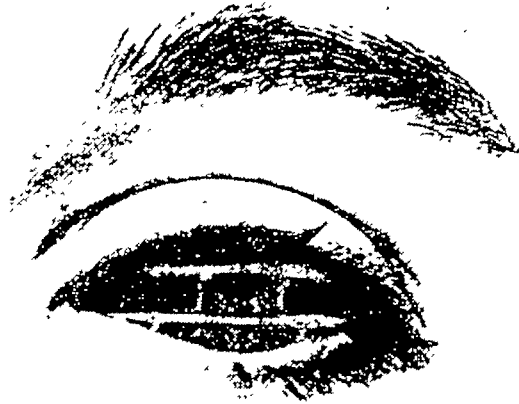
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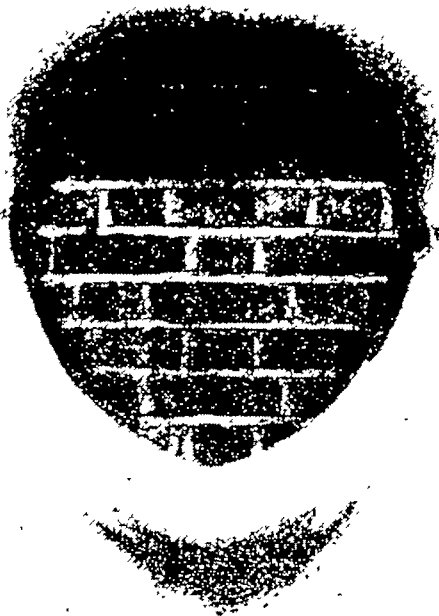
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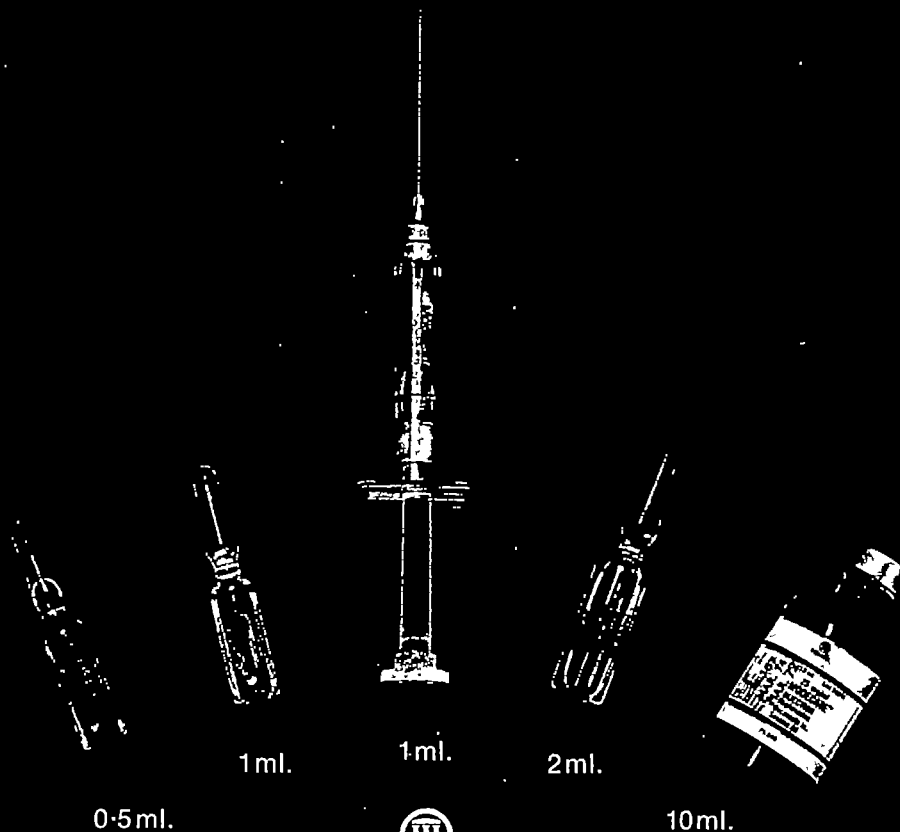
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## The Effectiveness of Lithium in Affective and Schizo-Affective Psychoses

By A. B. SMULEVITCH, G. I. ZAVIDOVSKAYA, A. L. IGONIN  
and N. M. MIKHAILOVA

Recently, though the value of lithium salts has been supported by a number of careful studies (1-6), it has become increasingly evident that as a preventive of affective and schizoaffective psychoses the use of lithium is far from being universally effective and that it does not always lead to a complete disappearance of phases and attacks (7-8). The most generally held view (9-13) of lithium as a prophylactic drug is that it is of most value in preventing the recurrent affective attacks of patients with manic-depressive psychosis and cyclothymia.

To enable lithium to be used more widely in psychiatric practice for preventive purposes it seems necessary that there should be further elucidation of its therapeutic abilities, and that some correlation should be established between the degree of effectiveness of lithium salts and the characteristics of the clinical picture and course of the psychoses. For this reason we have used lithium in the treatment of a wider range of disorders within the framework of both manic-depressive and schizophrenic psychoses.

This study is based on the results of long-term administration of lithium salts\* to 100 patients for more than a year. Of these 100 patients, 32 received lithium for a year, 53 for two years, and 15 for three years.

Of the 100 patients treated with lithium, 50 were diagnosed as manic-depressive psychosis, 49 as affective disorders in the framework of schizophrenia, and one as a case of periodical relapses of affective phases in an organic syndrome of the central nervous system (meningo-encephalitis).

In a number of cases the clinical picture of affective attacks was atypical.

\* In the preventive therapy we used 'lithionit-durules' (lithium sulphate) kindly provided by the Swedish firm of 'Astra'.

In schizoaffective psychoses, attacks were accompanied by a prevalence of polymorphous psychopathological conditions (acute delusions of reference, hallucinations, affective-illusional disorders, obsessive and coenesthopathic\*-hypochondriacal symptoms). When the manifest signs subsided, the clinical picture was characterized by pseudo-neurotic disturbances (anxious fears, obsessional ideas concerning the future) and pseudo-psychopathic symptoms (morbid doubts, uncertainty, emotional lability, tearfulness).

However, even in a relatively clear-cut cyclothymic state, a classical affective triad was only rarely encountered.

The clinical picture of depression was mainly characterized by symptoms of apathy, feelings of weakness, lack of energy, of wishes and of will, hypersomnia, loss of interests and occasionally indifference to the surroundings. Predominant mood disorders, anguish and anxiety were much less frequently seen.

Manias were also to some extent atypical, and were characterized by the predominance of irritability, unproductive hyperactivity, uninhibited drives, a decreased necessity to sleep. Only a few patients displayed the affect of gaiety and elation together with ideatory excitement and incoherent thoughts.

In order to obtain results which could be subjected to a quantitative analysis, the study was conducted on patients with affective phases relapsing more than once a year.†

\* Coenesthopathy refers to a variety of unpleasant, distressing sensations (tightening, burning, twisting, tickling) in the different parts of a body or in separate organs without apparent somatic cause.

† Patients with prolonged phases of several years were excluded from the study because it was impossible to estimate the therapeutic effectiveness during the control period of one year.

In order to avoid mistakes in the assessment of the preventive effect, and considering the data in current literature (14, 15), the beginning of treatment was taken to be from the middle of the remission during which lithium therapy had been initiated. For a phase-continuous course (continua type), the therapeutic period was considered to begin immediately from the end of the phase during which lithium had been used.

The results of a long-term use of lithium salts were judged according to the changes in the number of phases, the number of days of the disease and the frequency of hospital admissions of the 100 patients during a treatment period of 12 months in comparison with the preceding control period of the same duration.

However, in analysing the results of the therapy, we did not confine ourselves to the comparative quantitative registrations of changes observed in the therapeutic and control periods in these patients. We took into consideration the discussion published in the *Lancet* concerning the results of a long-term lithium use reported by Baastrup and Schou (2). The essence of criticisms made by Blackwell (16), Lader (17), Saran (18) and others was that the decrease in the number of affective phases during long-term lithium treatment could not be definitely associated with the therapy because in a selected group of patients investigated a similar decrease of affective disorders might occur spontaneously.

In order to avoid such reproaches and to increase the reliability of the results, we made a comparison of the disease development in 100 patients treated with lithium salts and the regularities of the disease in another 100 patients who were not on lithium. The control group was selected from an epidemiological material\* according to the 'double model'. At the same time we used the data of the clinical and epidemiological examination of a non-selected group of 3,648 patients suffering from schizophrenia and manic-depressive psychosis, who lived in two districts of Moscow and were registered in the district psychoneurological dispensaries. The study of the patients was conducted over

several years by the scientific workers of the Epidemiological Department of the Institute of Psychiatry of the U.S.S.R. Academy of Medical Sciences. Treatment of the data was by means of the computer. The fact that a large amount of epidemiological information is available enabled us to select for each patient 'a double' in the control group, i.e. an individual of the same age and sex, with a similar diagnosis, type of disease, frequency, polarity and duration of phases. The age and disease duration of the patients on lithium in comparison with the control group coincided within the limit of 5 years. A registration of quantitative data of the patients of the control group was accomplished during two years, which chronologically corresponded to both the control and treatment periods in the lithium-treated group.

This study is concerned with a detailed description of the methods of lithium preventive therapy (or of the estimation of and control of lithium content in the blood) used at the Institute of Psychiatry of A.M.S., U.S.S.R. This has been described in our previous paper (19), and we should only mention the fact that apart from some modifications our methods generally correspond to the criteria developed by M. Schou (1). At first the lowest doses of lithium were given: 1-2 tablets of lithionit-durules, equivalent to 200-400 mg. of lithium carbonate. Further, under the control of lithium content in the blood, the doses were raised to the optimal levels of 3-5 tablets (600-1,200 mg. of lithium carbonate). We used a dosage in which the lithium content in the blood was kept at 0.6-0.8 m.-equivalent.

Another stage of our study was to estimate quantitatively the preventive effect of lithium salts, on the basis of the results of the long-term administration of the drug to 100 patients (for more than a year).

A reduction in the overall number of affective phases in the patients studied (Fig. 1), as well as in the observation by I. N. Mikhaleenko (20) and Yu. L. Nuller (21) was highly significant, but not so great as in patients studied by Schou, Baastrup, Angst and Grof (6, 22). A reduction in the number of affective phases is clearly seen when comparing patients treated with lithium with the control group.

\* A study conducted by E. V. Panicheva.

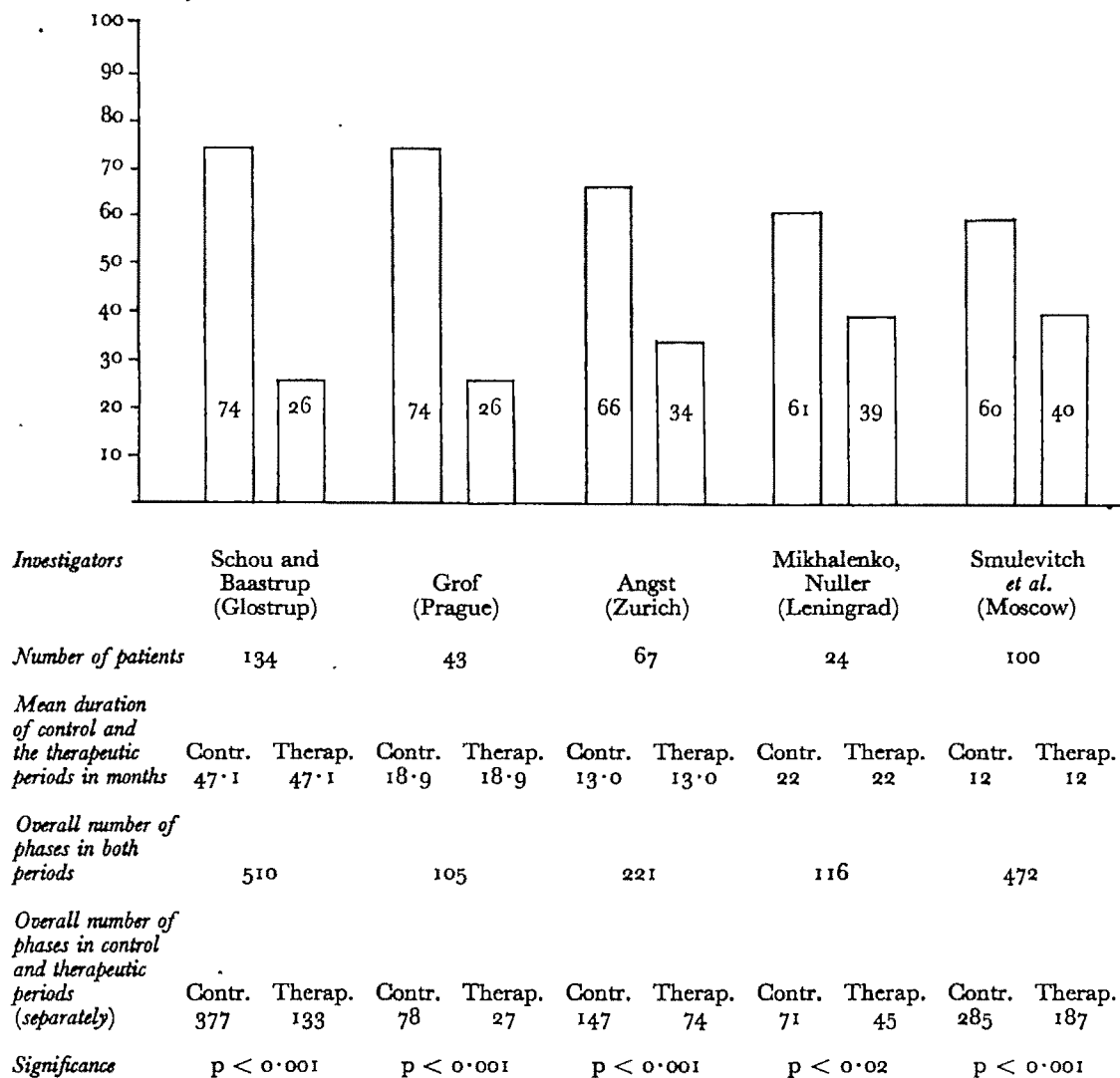


FIG. 1.—Comparative data by different investigators concerning number of affective phases in control and therapeutic periods (in per cent to overall number of phases in both periods).

Table I indicates that during the first year of lithium therapy, 24 per cent of the patients displayed no affective phases. The proportion of patients who had one phase during a year increased from 21 per cent to 33 per cent, while the proportion of those with two or more phases a year decreased from 79 per cent to 43 per cent. In the control group no significant change of the number of affective phases took place.

Similar results were obtained in regard to the number of hospital admissions.

In the control period the non-hospitalized group constituted 42 per cent of the patients; during the first year of lithium therapy this proportion was 87 per cent. The proportion of the patients admitted to hospitals decreased from 58 per cent in the control period to 13 per cent in the therapeutic period. A certain tendency to a spontaneous reduction in the



TABLE I  
*Patient distribution by number of affective phases*

| Patient groups                     |                                | Number of affective phases in a year |    |    |             |    |         |
|------------------------------------|--------------------------------|--------------------------------------|----|----|-------------|----|---------|
|                                    |                                | 0                                    | 1  | 2  | 3           | 4  | Above 4 |
| 100 patients under lithium therapy | Year preceding lithium therapy | —                                    | 21 | 43 | 19          | 6  | 11      |
|                                    | One year of lithium therapy    | 24                                   | 33 | 24 | 9           | 3  | 7       |
|                                    | Difference significance        | $p < 0.001$                          |    |    | $p < 0.001$ |    |         |
| 100 patients of the control group  | Year 1970                      | —                                    | 17 | 50 | 9           | 12 | 12      |
|                                    | Year 1971                      | 2                                    | 18 | 46 | 11          | 9  | 14      |

TABLE II  
*Patients distribution by number of hospital admissions*

| Patient groups                     |                                | Number of admissions |    |    |   |
|------------------------------------|--------------------------------|----------------------|----|----|---|
|                                    |                                | 0                    | 1  | 2  | 3 |
| 100 patients under lithium therapy | Year preceding lithium therapy | 42                   | 40 | 18 | — |
|                                    | One year of lithium therapy    | 87                   | 13 | —  | — |
|                                    | Difference significance        | $p < 0.001$          | —  | —  | — |
| 100 patients of the control group  | Year 1970                      | 51                   | 31 | 15 | 3 |
|                                    | Year 1971                      | 63                   | 28 | 7  | 2 |

number of admissions was also observed in the control group, but here the difference was not statistically significant.

The assessment of lithium therapy effectiveness was done not only according to these generally accepted (23) indices, but also according to the more 'sensitive' (19) index comparing the overall number of days of illness in the control period and after the beginning of treatment. Under the influence of lithium therapy the number of days of illness dropped significantly from 23,318 in the control period to 9,217 in the therapeutic period, i.e. by 2.5 times.

It is important to emphasize that the drug produces not only a preventive (in the narrow sense of the word) action, but a therapeutic one as well.

The initial therapeutic effect of lithium which was revealed during the first months of treatment consisted of a modification of the clinical picture of both manic and depressive attacks and phases. Attacks became less severe and could be successfully treated under out-patient conditions. Even during subsequent exacerbations the patients were able to continue their work and manage their routine duties, though with some difficulty.

First, the severity of affective disorders became less. In depressive states there was diminution of anxiety, anguish and ideatory and motor retardation. The patients reported that during the following attacks they had no tormenting sensations of anguish and morbid insensibility (anaesthesia dolorosa), although sad moods, melancholy and emotional shallowness remained. During both depressive and manic periods they had or acquired an insight into the disease, and believed that the morbid changes would pass. Ideas of guilt were no longer obsessive. Along with this, the clinical picture was accompanied by apathy, fatigue, loss of activity, insomnia, somatic and autonomic depressive signs, a bitter taste in the mouth, a loss of weight and appetite, dyspeptic disturbances and constipation.

In mania also a reduction of psychopatho-

logical phenomena was observed. First, the manic attacks were characterized by a diminution of irritability, anger, explosiveness and distractibility. Ideas of grandeur, reformation, invention—as with the guilt ideas in depressions—no longer influenced the patients' behaviour; even in the most severe states they perceived abnormal ideas as morbid phenomena and did their best to control behaviour.

In spite of its general high effectiveness the preventive character of lithium therapy is not distinctly seen in each case. While using lithium salts even for a long period of time, in 20–40 per cent of the cases (8, 24) no changes in the disease manifestation were observed. In the remaining 60–80 per cent, preventive therapy with lithium salts was found to produce different effects; in some cases a cessation of phases was seen, in others there was a reduction of their number and there were longer remissions; in certain ones only a slight reduction in psychopathological manifestations was displayed. The majority of investigators (6, 14, 25, 26) are inclined to find the reasons for such differences in a syndromological (monopolar and bipolar cycles) or nosological (manic-depressive, schizoaffective, reactive psychoses, etc.) differentiation. However, the scientists have not come to the same conclusion in an analysis of clinical materials.\*

While analysing the observations described in this study, greatest attention was paid to the characteristics of the process development (stabilization, progressive development), as well as to the correlations between the morbid phenomena and constitutional personality traits.

The alteration of the clinical picture in patients differed in diverse premorbid characteristics, psychopathological symptoms of phases, and course of illness. The most demonstrable therapeutic effect was seen in 64 patients (Group 1). Among these there were 32 patients with a diagnosis of schizophrenia, 31 with manic-depressive psychosis and 1 with CNS organic lesion. In this group there was either a complete disappearance of phases (24 cases) or

reduction in their number (40 cases). At the beginning of lithium therapy the majority of these cases were characterized by a slowly progressive course with a tendency to stabilization. As a rule these were relatively late stages of the disease, when remitting affective phases began to dominate the clinical picture.

In the majority of cases in this group the onset of the disease took place in adolescence. In schizophrenic cases, it was displayed either as manifest or prolonged shifts\* developing like a pathological puberty crisis. In manic-depressive psychosis, the onset manifested itself atypically as reactively provoked attacks of depression which only later took the form of similar periodic endogenous phases.

Before their illness most of the patients of this group (58 cases) could be considered as expansive schizoids† with traits of rigidity and monotonous activity. A stable, life-long hyperthymic elated mood in the absence of the signs of symptomatic or autochthonic affective lability was characteristic of these patients. Only 6 patients of this group could be considered to be sensitive schizoids.†

The treatment proved to be effective, although to a less extent, in 22 patients (Group 2). Here the number of phases remained the same, but they became shorter in duration, with reduced affective signs. Schizophrenia was diagnosed in 9 of these cases and manic-depressive psychosis in 13. In these cases from the very beginning the disease had a character of affective or schizoaffective psychosis with an attack-like course. In schizophrenia the disease was manifested by acute affective-delusional attacks (7 cases) and only later acquired a more favourable course which could be seen in a simplification of symptoms due to a domination of affective disorder in the clinical picture. At the time of initiating lithium therapy, in 6 cases the course was of a 'continua type'; in one patient affective phases occurred as periodical exacerbations on a background

\* Shifts are a variety of psychotic conditions preceding or following which there may be different degrees of psychic disorders.

† The determination of types of schizoid personality was done in accordance with the description of schizoid temperaments by Kretschmer (29).

\* No definite correlation was found between the effectiveness of lithium salts on indices such as age, sex, duration of illness, average lithium content in the blood (27, 28).

of adynamic depression. In all cases of manic-depressive psychosis referred to in this group, a clear-cut periodicity of phases was observed from the very beginning of the manifestations of the disease.

As for premorbid features in the patients of the second group, they were mostly personalities of a cycloid type with signs of affective lability, anxious preoccupation and sensitivity.

Finally, lithium therapy failed to have any effect on the remaining 14 patients (Group 3), who displayed no changes in their condition or even a greater frequency of attacks and phases (2 cases). In this group (8 patients with schizophrenia, 6 with manic-depressive psychosis) there were mainly individuals with characteristic sensitive and schizoid traits in the premorbid period. In addition, unlike the first two groups, the disease, which usually started in adolescence (in schizophrenia), was progressive from the very onset. This became apparent, on the one hand, in a gradual complication of the clinical picture due to the addition of depersonalization, neurotic, over-valued and even delusional disturbances; and, on the other hand, in a deterioration of the following remissions. Thus the disease course at its subsequent stages acquires a remissionless type.

At the beginning of lithium therapy, according to the characteristics of process development, some (4) patients were diagnosed provisionally as shift-like schizophrenia. In the periods between attacks they had no stable remissions, and the observed improvement of illness was closely connected with psychotropic drug therapy. In two other patients the disease developed slowly, but with signs of a steady progressiveness, thus considered in the framework of the 'sluggish' forms.\*

In manic-depressive patients ineffectively treated with lithium salts, similar regularities in illness development were observed, compared with the remaining cases in the group. They were as follows: manifestation of affective attacks in adolescence with a subsequent aggravation of the disease to a higher frequency of phases and a shorter duration, and a poorer quality of remissions. By the beginning of lithium therapy

the disease in three patients was developing as a 'continua type'; in two cases a deterioration of remission quality took place due to the formation of residual affective symptoms, i.e. affective disorders become constant symptoms resistant to thymoleptic drug therapy.

It is apparent that the presented data are not sufficient to draw any final conclusions concerning the preventive quality of lithium. Nevertheless, the available observations based on a long-term use of the drug in a sufficiently large number of patients indicate that lithium salts are an effective preventive drug in affective and schizoaffective psychoses within the framework of manic-depressive psychosis and schizophrenia. At the same time the most favourable conditions for the effect of the preventive qualities of lithium are usually seen during a relative stabilization of the process. The question in mind concerns the remissions after shifts with periodically relapsing affective phases. The drug is particularly effective in those cases when affective phases are not closely connected with the constitutional traits of a premorbid personality and they appear at the late stages of the disease; thus they are heteronomic disorders (they are not peculiar to a certain usual temperament).

As far as manic-depressive patients are concerned, lithium therapy gave best results in recurrent identical phases which repeated periodically without an increase in their severity.

Failures were most probable in cases of affective and schizoaffective psychoses with distinct signs of a progressive development.

An obstacle to the wide use of prolonged preventive lithium therapy is its complicated method, requiring relatively frequent monitoring of lithium content in the blood. In this connection the question was raised whether the assessment of lithium content in the blood is necessary, and if necessary how frequently it should be done.

An analysis of our observations in this respect showed that patients need different doses of the drug to produce the same optimal drug content in the blood (0.6-0.8 m.equiv.). Doses may vary in relatively broad ranges (from 2 to 6 tablets of lithionit-durules). This indicates the necessity for controlling lithium

\* 'Sluggish' schizophrenia is a very gradual, durative, non-florid psychotic development of the morbid process.

content in the blood. Later, in the process of prolonged therapy, individual sensitivity to the drug is relatively stable and doses should rarely be changed (in 15 per cent of the patients every three months), and as a rule, by only one tablet at a time. Only occasionally during several months was the dose changed by two tablets at the same time.\*

Taking into consideration a certain stability of dosages and the absence of severe complications, it may be recommended that the lithium content in the blood should be checked once in 2-3 months. An exception should be made for patients suffering from gastro-intestinal, urinary or cardio-vascular diseases, as well as for aged patients. In such cases, because of a higher probability of complications of the drug, its content in the blood should be controlled once a month.

As Table III shows, during the third year of treatment, some indices of patient condition pointed to a worsening of the clinical condition as compared to those in the second year. Both an increase in the number of days of illness (from 66 to 72 per patient) and an increase in the number of admissions (from 0.13 to 0.20 per patient) confirmed this.

TABLE III  
*Development of illness course during 3 years of lithium therapy*

| Indices               | Number of patients | Number of affective phases per patient | Number of days of illness per patient | Number of hospital admissions per patient |
|-----------------------|--------------------|----------------------------------------|---------------------------------------|-------------------------------------------|
| 1st year of treatment | 100                | 1.87                                   | 98                                    | 0.13                                      |
| 2nd year of treatment | 53                 | 1.66                                   | 66                                    | 0.13                                      |
| 3rd year of treatment | 15                 | 1.46                                   | 72                                    | 0.20                                      |

\* In cases where 3-4 tablets a day were used to maintain the optimal drug content in the blood (approximately 70 per cent of the patients) the doses remained stable for a long time. More frequently minimal (2 tablets) and maximal (5 or 6 tablets) doses were changed.

In spite of the fact that the differences above mentioned are slight and have been obtained from an insufficiently representative material on 15 patients, and thus are statistically non-significant, we consider these facts to deserve much attention. One cannot deny that prolonged treatment with lithium, as with other psychotropic drugs, in some cases leads to a habituation accompanied by a decrease in effectiveness.

If this assumption is supported by further studies, it will be necessary, for a successful prevention of affective psychoses, in some cases to substitute for lithium salts other drugs with a different structure and similar action. Consequently, comprehensive pharmacological studies in compounds of other metals of the sodium group seem to be urgently needed. At present, available data enable us to assume that some compounds, rubidium salts in particular (30), display certain activity in affective disorders and these may prove to be efficacious in the preventive therapy of affective psychoses.

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## Once versus Thrice Daily Thiothixene in the Treatment of Schizophrenic In-Patients\*

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Reports have been accumulating in the literature attesting to the failure of patients, particularly out-patients, to take medication as prescribed (Stewart and Cluff, 1972; Moulding *et al.*, 1970). The incidence of these failures, which may include anything from missing occasional doses to taking no medication at all, has been reported to range from 25-59 per cent. In addition, it has not been possible to identify those patients who will have the highest failure rates (Blackwell, 1972). While most of the studies have involved medical patients, it is probably legitimate to assume that schizophrenic patients are at least as unreliable in taking medication as the medical patients. Thus, in one study of 125 psychiatric patients, Willcox *et al.* (1965) found that 48 per cent took no medication at all.

It is also clear that the majority of schizophrenic patients need to take their maintenance medication to prevent relapses and possible readmissions (Leff and Wing, 1971). These facts would suggest that ways should be found to ensure a greater adherence to prescription regimens. One method which has received some attention in the literature is simplifying the dosage schedule. There are reports going as far back as 1958 suggesting that neuroleptic medication need not be administered on a three to four times daily basis but can instead be administered once daily, at bed-time, without loss in efficacy. [In the review of these reports to follow, no attempt will be made to deal with sustained-release preparations.]

The earlier reports were anecdotal. Tibbets

(1958a) changed the chlorpromazine medication of a group of long-stay male patients from a t.i.d. schedule to a single morning dose (up to 200 mg.). He noted increased lethargy about an hour after administration in one or two patients, but otherwise, the results with a single dose were similar to those obtained with multiple doses. In a follow-up report, Tibbets (1958b) was less enthusiastic because of the excessive drowsiness, listlessness, pallor and malaise found in approximately 50 per cent of the patients. It should be noted that the once-daily dose was administered in the morning and that it was only the side effects (not a failure in efficacy) that rendered the method less satisfactory. Haden (1959) routinely placed all his in-patients on once-daily (bed-time) medication after a two week stabilization period. He commented on the saving in nursing time and the conversion of bothersome daytime drowsiness into a beneficial sedative effect at bedtime. He also noted the economy involved (e.g. a 100 mg. tablet is less expensive than four 25 mg. tablets). Roberts (1961), in an exploratory study of once daily medication, found adequate efficacy, while noting fewer extrapyramidal side effects. Unfortunately, he compared his efficacy and incidence of side effects with other reports in the literature and did not employ a control group in his trial. Denber and Travis (1958) noted that a twice daily schedule was as effective as a t.i.d. schedule, but reported relapses on a single dosage regimen. The nature of the relapses (i.e. side effects or therapeutic failures) was not specified, nor was the time of administration of the single dose.

Peterson and Olsen (1963) performed the first experimental evaluation of single vs. multiple dosage regimens. Using ward beha-

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viour rating scales, they compared a bed-time administration with a regular t.i.d. schedule. In their first trial, they found greater improvement in the bedtime group, which they were unable to explain as it was a maintenance trial (with no change expected, except perhaps deterioration). They repeated the trial with different patients and for a longer period (six months) and obtained the same result. It may be hypothesized that since the evaluation were primarily of ward behaviour, the decreased day-time side effects in the once-daily group may have been seen as improved clinical status.

Brophy (1969), in an uncontrolled evaluation of out-patient schizophrenics, reported success with a once-daily regimen, although he distinguished between piperazine and non-piperazine derivatives. He felt the results with the latter were more equivocal. Chien and DiMascio (1971), in an uncontrolled study comparing a variety of administration schedules including intermittent medication, found b.i.d. administration at least equivalent to t.i.d. when administered daily. Polvan *et al.* (1971) compared b.i.d. and bed-time medication in a complex though uncontrolled design and reported fewer extrapyramidal side effects on the bed-time regimen.

Only two studies have employed a double blind procedure. Hruska *et al.* (1966) compared once *vs.* thrice daily administration schedules and a sustained-release capsule. Only the former section of the study was blind and will be discussed here. Slightly better therapeutic efficacy was noted with the once daily than with the thrice daily regimen. They also reported fewer side effects with the simpler regimen, although, as they noted, a more rigorous side effect evaluation might have been employed. Vestre and Schiele (1966), using a double blind design, compared a once and thrice-daily regimen of thioridazine in chronic in-patients. (The study also included two groups receiving sustained-release preparations). The trial essentially evaluated a maintenance programme; patients were changed directly from their regular medication to one of the two dosage schedules for 8 weeks. Psychiatric symptomatology, work performance and side effects were evaluated, and no differences were found

between the single and multiple dosage schedules.

While the above studies all reported no difference in clinical efficacy between the one-daily administration of neuroleptics and multiple doses, they varied widely in the degree of design sophistication, with only minimal use of controls and evaluation procedures. The results with side effects were more equivocal; at least one study (Tibbets) reported more side effects on an A.M. regimen, but in other studies employing a bed-time regimen the trend was to fewer side effects with the single dose. In this area even less rigorous evaluations were employed. The need, therefore, existed for a well controlled study in which rigorous side effect evaluations would be included and incorporating an adequate efficacy design. For example, in none of the studies were placebo baseline evaluations employed, nor were there any evaluations of the relative efficacy of the two forms when stabilizing the patients (all studies were maintenance studies). To this end, we carried out a double-blind crossover comparison of once *vs.* thrice-daily thiothixene in chronic schizophrenia.

## METHOD

### Subjects

Thirty-eight chronic schizophrenic in-patients (20 males and 18 females) comprised the subject population. The mean age of the patients was 50.6 years (s.d., 10.8 years and range, 25-64 years). The mean length of stay in hospital was 20.7 years (s.d., 11.5 years and range 1-38 years). All patients were in good physical health at the time of the study and no concurrent medication was administered.

### Procedure

A drug holiday was instituted for four weeks in 32 patients and for six weeks in six patients during which placebo identical in appearance to the active medication was administered. The extended placebo period for the second group was employed because the patients had shown insufficient slippage during the four week period. Thiothixene was then administered on a fixed dosage regimen for eight weeks. Half the patients received the total

dosage in one dose, and the others in three divided doses. This was followed by a second four or six week placebo period (the patients who required a six week period initially were placed on a similar period at this point). A crossover then took place, with those patients who originally received the once daily changing to thrice daily and *vice versa*. This phase also lasted eight weeks.

The two different dosages of thiothixene (5 and 10 mg.) and placebo were supplied in identical capsules. In order to blind the study, all patients received two tablets in the A.M., two tablets in the P.M. and four tablets in the evening throughout all phases of the trial. The dosage began at 15 mg. daily and was increased by 5 mg. each week to a maximum of 40 mg. daily, maintained for the last three weeks of each active drug phase. By varying the mg. potency and number of placebo capsules, the required doses were obtained. For example, during the 30 mg. daily week, those on a t.i.d. schedule received two 5 mg. tablets in the A.M., two 5 mg. tablets in the P.M. and two 5 mg. and two placebo tablets in the evening. In the once-daily group, two placebos were dispensed in the A.M. and in the P.M. while the evening dose consisted of three 10 mg. tablets and one placebo. Individually labelled envelopes containing each dose were made up in advance of the study and were distributed to the wards at weekly intervals.

The patients were seen weekly throughout the study by the research psychiatrists, and changes in their global psychiatric condition were rated on a scale from -2 to +6, where negative numbers indicate a worsening, positive numbers an improvement, and zero no change.

The Brief Psychiatric Rating Scale (BPRS) (Overall and Gorham, 1962), and the Clinical Global Impression Scale were completed by the psychiatrist every four weeks throughout the study. The latter scale consists of two items: the degree of mental illness and the amount and type of change in the patients' condition. The nurses completed the Nurses' Observation Scale for Inpatient Evaluation (NOSIE) (Honigfeld and Klett, 1965) every two weeks throughout the study.

The psychiatrist conducted an examination for extrapyramidal side effects weekly and the

results were recorded on the Neurological Rating Scale (Simpson and Angus, 1970). This scale consists of ten items: Gait, Arm Dropping, Shoulder Shaking, Elbow Rigidity, Wrist Rigidity, Leg Pendulousness, Head Dropping, Glabella Tap, Tremor and Salivation. The scores were combined to form four factors (Rigidity, Tremor, Glabella Tap and Salivation); a total score is also obtained.

Handwriting samples (two replications of a four-line nursery rhyme) were collected weekly on all patients. As extrapyramidal side effects develop, corresponding changes are noted in handwriting, namely, cramping, tremor and tremulousness. The actual area enclosed by each sample was determined using a planimeter to assess the degree of cramping (Simpson *et al.*, 1972).

## RESULTS

For the purposes of the statistical analyses, the scores of the once-daily regimen were combined, as were the scores of the thrice-daily regimen. To do this, the scores of the second group who received the thrice-daily followed by the once-daily were reversed and combined with the first group. Treatment by subjects analyses of variance were used to determine whether there were differences in the various rating scale scores over the trial.

The mean weekly Psychiatric Evaluation scores are shown in Fig. 1. The analysis of variance was significant, and the Scheffe procedure indicated that improvement over the baseline occurred by the third week of medication in the thrice-daily group and by the fifth

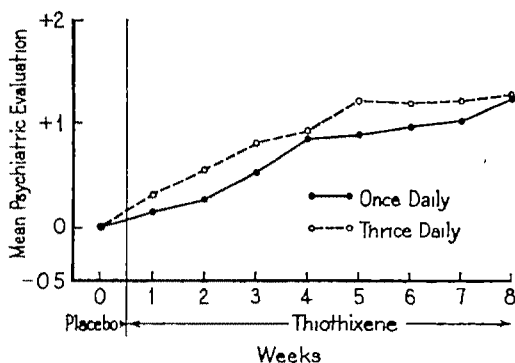


FIG. 1.—Mean weekly psychiatric evaluations.



week in the once-daily group. None of the weekly differences between the once-daily and thrice-daily regimen was significant.

Each of the 18 BPRS items, the four derivative factors and the total scores were analysed using similar analyses of variance. The following variables showed significant changes over time: Emotional Withdrawal, Conceptual Disorganization, Tension, Mannerisms and Posturing, Uncooperativeness, Blunted Affect, Excitement, the Withdrawal-Retardation factor and the total Morbidity score. In all cases, the changes were in the direction of progressively less pathology from the baseline through the fourth week evaluation to the eighth week rating. The improvement was noted with both regimens, while a worsening occurred during the placebo periods.

Both the global items (Degree of Mental Illness and Change in Condition) showed that significant improvement occurred over the trial with both the once-daily and the three-times daily regimen.

Analyses of covariance, using the placebo baseline evaluation as the covariate, were performed on the same BPRS scores to determine whether there were differences between the two schedules. None of the analyses was significant, indicating there was no difference in the scores of the once-daily and thrice-daily groups at four and eight weeks.

Similar analyses of variance and covariance were performed on the NOSIE factor scores. The following factors showed significant changes during the trial: Social Competence, Social Interest, Personal Neatness, Manifest Psychosis, Retardation and Total Patient Assets. Analysis of the two global measures (Degree of Mental Illness and Change in Condition) were also significant. In all cases there was an increase in pathology off medication, with an improvement appearing with active medication. The Scheffe Multiple Comparison Test indicated improvement over the baseline occurred sooner with the thrice-daily regimen in four of the above items. In no case did it appear sooner in the once-daily regimen.

The analysis of covariance results indicated that the two regimens differed on only one factor, Manifest Psychosis. The thrice-daily

group had better scores at weeks two and six than the once-daily group, though this difference disappeared during the final week of the trial.

The mean total Neurological Rating Scale scores are shown in Fig. 2. There was a progressive increase in scores with each dosage increase for both regimens, with a slight decrease during the final weeks of the trial. The analyses of variance were significant for Rigidity, Tremor and Total Score. The Scheffe procedure indicated that an increase over the baseline in the Total Score occurred during the third to fifth week of the thrice-daily administration and during the fourth to sixth week of the once-daily schedule. Similar trends were seen with Rigidity and Tremor. Two of the analyses of covariance on the Neurological Scale variables were significant: Tremor during the second week of the active trial and Glabella Tap during the seventh week of the trial. In both, higher scores occurred with the thrice-daily regimen. Although the remaining comparisons were not significant, higher scores were seen for the thrice-daily group in 25 of the 30 comparisons.

The mean handwriting areas are shown in Fig. 3. The decrease in handwriting size with the active drug over the placebo condition was statistically significant. However, there was no difference between the two schedules in the degree of cramping.

#### DISCUSSION

The general results in this study were in keeping with earlier reports in the literature;

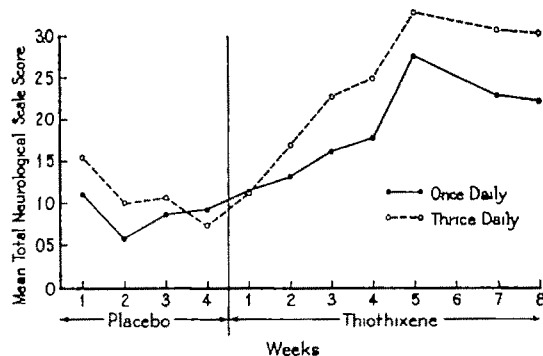


FIG. 2.—Mean weekly total neurological scale scores.

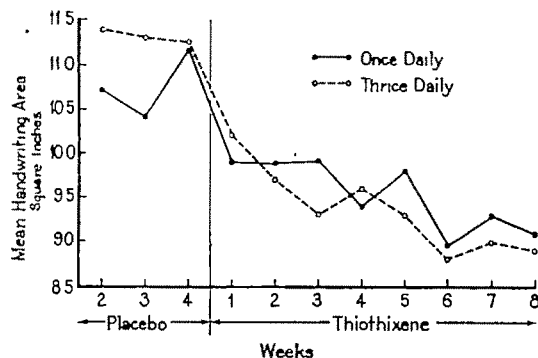


FIG. 3.—Mean weekly handwriting area.

no difference was seen in therapeutic efficacy between single and multiple dosage regimens of neuroleptics during the *maintenance* phase of treatment. However, there was a clear tendency for multiple doses to be more effective than the once-daily regimen during the initial stabilization period. In our work with lithium, it has been clearly shown that the more frequent the administration, the higher the steady state and the sooner the therapeutic level is reached (Bergner *et al.*, 1973). The results of the present study suggest a similar mechanism with neuroleptics. Thus, early in treatment multiple doses maintain higher blood levels of the neuroleptic which in turn facilitate a more rapid increase in tissue concentration. Correspondingly, the higher tissue levels effect a faster clinical response. However, once the saturation level is reached in the tissues, a single dose regimen is sufficient to maintain the level and the therapeutic effect.

Extrapyramidal side effects were assessed using the Neurological Rating Scale, and while the differences between the two regimens reached significance on only a few occasions, there was a consistent trend for more pathology to be seen on the multiple dosage regimen.

In the present study, the total once-daily dosage was given in the evening. This particular plan has the advantage that the drowsiness and sedation found with neuroleptics occur at a time when it can function as bed-time sedation; at the same time the disruptive effects of day-time drowsiness are avoided. In addition, the extrapyramidal effects are less marked during the day, presumably because the peak effect of

the drug occurs during sleep. There have been reports of dystonic reactions occurring in sleep with a bed-time regimen (Roberts, 1961), but this was not found in the present study. The handwriting samples showed a marked decrease in size during the trial, though the method did not differentiate between the two dosage regimens.

The results in general would suggest that maintenance medication can be safely administered in one dose, and if this is a bed-time dose side effects will certainly be no more numerous and perhaps even less. In addition, a bed-time dose can in fact make use of the sedative side effects which are so troublesome during the day. However, during the initial stabilization period more frequent doses give the clinician greater flexibility while effecting faster improvement. Multiple dosage schedules are undoubtedly a carry-over from general medicine, where many drugs (e.g. antibiotics) do require more frequent administrations. However, it is well known that phenothiazines have a long biological half-life, and this alone should argue for less frequent administrations. The possibility of high single doses producing catastrophic side effects has probably remained in clinicians' minds, and the demonstration in this study of no problems with side effects on a once daily regimen should help dispel this lingering fear.

If once-daily maintenance schedules have utility in the longer-stay institutions, particularly in terms of economics and savings in nursing time, they have even more potential in out-patient populations. The embarrassment of taking medication at work, which undoubtedly adds to the default rate, is avoided. At the same time, a single bed-time dose is often more acceptable to patients because it is interpreted as 'less sickness', whereas multiple doses serve as frequent reminders of their problems. Finally, a single dose is easier to remember and thus may improve prescription compliance, although this last possibility remains to be verified in psychiatric patients.

#### SUMMARY

Thirty-eight chronic schizophrenic in-patients participated in a double blind crossover com-

parison of once-daily versus thrice-daily administered thiothixene. The once-daily dose was given at bed-time. Improvement over the placebo baseline occurred with both regimens though it appeared somewhat sooner with the multiple dosage regimen. During the final maintenance phase of the trial there was no difference between the regimens. Extrapyramidal side effects were consistently more marked with the multiple dosage regimen, though the difference reached statistical significance on only a few occasions. The practical applications of these findings are discussed, particularly in terms of maintenance therapy for both in-patients and out-patients and of the possibility of improving prescription compliance in the latter.

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## Thiothixene and Thioridazine in Anxiety

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### INTRODUCTION

Thiothixene and thioridazine, established anti-psychotic agents (5), have been reported to possess antidepressant (4, 7, 8, 9, 17) and anxiolytic (3, 15, 16) properties. The present study is primarily concerned with the latter claim. It was initiated to assess the role of both these major tranquillizers—thiothixene, a thioxanthene derivative, and thioridazine, a phenothiazine derivative—in the symptomatic treatment of anxious neurotic out-patients.

### METHOD

#### *Population*

A total of 155 primarily anxious, at times somatizing and/or secondarily depressed, neurotic out-patients participated in this study. Excluded from the study were patients under 21 years of age and patients with strong sociopathic trends, character disorders, organic brain syndrome, or evidence of schizophrenia.

Patients attended either the psychopharmacology clinic of the Philadelphia General Hospital or the offices of several general practitioners (GP). Physicians in both treatment settings had been trained by us in psychopharmacological research and had previous experience within our group. Visits of clinic patients, treated by psychiatrists, lasted longer than visits of GP patients: 77 per cent as compared to only 36 per cent having visits which lasted longer than 20 minutes ( $p < .001$ ).

As may be seen in Table I, patients were predominantly female (78 per cent) and had a mean age of 39 years. GP patients differed from clinic patients primarily in variables related to social class. They were also more frequently diagnosed by their physicians as suffering from a mixed anxiety-depressive reaction or 'other' form of neurosis. Whether or not this difference reflects actual patient differences, or only differences in the way family physicians and clinic psychiatrists diagnose similar patients, is difficult to ascertain. Actually, the lower socio-economic class clinic patients, who were more frequently given the diagnosis of anxiety neurosis, were significantly

lower in anxiety but higher in somatic complaints than the GP patients. No other population differences in psychopathology could be demonstrated in either physician or patient measures.

Patients for the most part expected psychiatric medication, and physicians in both populations generally liked their patients (82 per cent). The majority (84 per cent) of patients had been previously treated with psychotropic medications; these were most frequently chlordiazepoxide and/or diazepam, but patients also reported having taken a variety of other minor tranquillizers and tricyclic antidepressants. Of these pre-treated patients, 70 per cent reported a fair or poor response to their medication; yet fully 81 per cent of all patients expressed a positive attitude toward medication.

A comparison of demographic and illness variables for the three drug groups indicated that our randomization procedure was successful in producing similar treatment groups. Similarly, we found no significant differences in the pre-treatment psychopathology scores of the three treatment groups.

#### *Study design*

A double-blind method was employed and medication was provided in a systematized random order. This resulted in 52 patients receiving thiothixene, 52 thioridazine, and 51 placebo. Fifty-three per cent of the patients were treated in our psychiatric clinic and 47 per cent in general practice. The study atmosphere could be considered therapeutic in both populations. Study duration was 4-6 weeks, i.e. treatments were discontinued after four weeks if the treating physician believed it to be in the best interest of the patients, and patients were evaluated at two-week intervals.

#### *Medication*

The three medications were prepared in identical capsules, each containing 2 mg. of thiothixene, 25 mg. of thioridazine, or lactose (placebo). Patients were told to take 3 capsules daily (6 mg. of thiothixene or 75 mg. of thioridazine) for the first two weeks of treatment. Patients were requested to return all unused medication, and pill counts were performed

whenever possible as one of several checks on dosage intake.

During the first two weeks, 73 per cent of thiothixene-, 86 per cent of thioridazine-, and 86 per cent of placebo-treated patients reported having taken the prescribed daily dosage (i.e. 3 capsules per day). Of the 22 patients who discontinued their medication on their own during the first two weeks, all but 7 did so after one week of treatment.

After two weeks of treatment, physicians were allowed to increase the patient's dosage to 6 capsules per day (12 mg. of thiothixene or 150 mg. of thioridazine). If this increase proved too high for a specific patient, he was allowed to reduce his medication. From two to four weeks, 60 per cent of thioridazine and 64 per cent of placebo patients, but only 46 per cent of thiothixene patients took more than 3 capsules daily. This difference in medication intake is not,

TABLE I  
*Description of population*

| Variables                                |    |    |    |    |    | Psychiatric<br>clinic<br>(N=82) | General<br>practice<br>(N=73) | Total<br>(N=155) | p <  |
|------------------------------------------|----|----|----|----|----|---------------------------------|-------------------------------|------------------|------|
| <b>Sex:</b>                              |    |    |    |    |    |                                 |                               |                  |      |
| Male                                     | .. | .. | .. | .. | .. | 19                              | 15                            | 34               | n.s. |
| Female                                   | .. | .. | .. | .. | .. | 63                              | 58                            | 121              |      |
| <b>Race:</b>                             |    |    |    |    |    |                                 |                               |                  |      |
| White                                    | .. | .. | .. | .. | .. | 25                              | 62                            | 87               | .001 |
| Black                                    | .. | .. | .. | .. | .. | 56                              | 11                            | 67               |      |
| Age (S.D.)                               | .. | .. | .. | .. | .. | 36 (12)                         | 43 (13)                       | 39               | .01  |
| <b>Marital status:</b>                   |    |    |    |    |    |                                 |                               |                  |      |
| Single                                   | .. | .. | .. | .. | .. | 23                              | 13                            | 36               | n.s. |
| Married                                  | .. | .. | .. | .. | .. | 34                              | 44                            | 78               |      |
| Separated, divorced, widowed             | .. | .. | .. | .. | .. | 24                              | 15                            | 39               |      |
| <b>Social class:</b>                     |    |    |    |    |    |                                 |                               |                  |      |
| I-III                                    | .. | .. | .. | .. | .. | 10                              | 23                            | 33               | .01  |
| IV                                       | .. | .. | .. | .. | .. | 30                              | 23                            | 53               |      |
| V                                        | .. | .. | .. | .. | .. | 38                              | 21                            | 59               |      |
| <b>Duration of present episode:</b>      |    |    |    |    |    |                                 |                               |                  |      |
| ≤ 12 months                              | .. | .. | .. | .. | .. | 53                              | 40                            | 93               | n.s. |
| < 12 months                              | .. | .. | .. | .. | .. | 29                              | 33                            | 62               |      |
| <b>Psychiatric diagnosis:</b>            |    |    |    |    |    |                                 |                               |                  |      |
| Anxiety reaction                         | .. | .. | .. | .. | .. | 58                              | 31                            | 89               | .001 |
| Mixed anxiety-depressive reaction        | .. | .. | .. | .. | .. | 7                               | 27                            | 34               |      |
| Other neurotic diagnoses                 | .. | .. | .. | .. | .. | 17                              | 15                            | 32               |      |
| <b>Previous drug treatment response:</b> |    |    |    |    |    |                                 |                               |                  |      |
| No drug                                  | .. | .. | .. | .. | .. | 12                              | 12                            | 24               | n.s. |
| Very good, good                          | .. | .. | .. | .. | .. | 19                              | 19                            | 38               |      |
| Fair, poor                               | .. | .. | .. | .. | .. | 48                              | 39                            | 87               |      |
| <b>Initial psychopathology:</b>          |    |    |    |    |    |                                 |                               |                  |      |
| <b>Physician questionnaire clusters:</b> |    |    |    |    |    |                                 |                               |                  |      |
| Emotional                                | .. | .. | .. | .. | .. | 3.88                            | 3.91                          | 3.89             | n.s. |
| Somatic                                  | .. | .. | .. | .. | .. | 3.80                            | 3.30                          | 3.57             | .01  |
| PQ anxiety item                          | .. | .. | .. | .. | .. | 5.14                            | 5.48                          | 5.32             | .05  |
| PQ depression item                       | .. | .. | .. | .. | .. | 4.15                            | 4.44                          | 4.29             | n.s. |
| <b>Symptom checklist:</b>                |    |    |    |    |    |                                 |                               |                  |      |
| Total score                              | .. | .. | .. | .. | .. | 2.14                            | 2.09                          | 2.12             | n.s. |

however, statistically significant. Mean daily medication intake at four weeks was 4.21 for thioridazine, 4.39 for placebo, but only 3.56 for thiothixene. It should be noted that we excluded from all improvement analyses any patient whose average daily dose was one capsule or less.

#### *Clinical criterion measures*

(1) *Intake Form* (completed at first visit), used for recording demographic and predictor variables; (2) *Physician Questionnaire* (PQ) (completed on each visit), on which a number of neurotic psychopathology items, forming an Emotional and a Somatic cluster, are rated by the physician on 7-point scales ranging from 'not-present' [1] to 'extremely severe' [7] (12). Such information as time spent with the patient, dosage deviation, side reactions, and blood pressure, pulse, and degree of global improvement are also recorded; (3) *Patient Symptom Checklist* (SCL) (completed on each visit), a 35-item version of a 64-item patient self-rating neurotic symptom distress scale, providing 5 clinical factors (General Neurotic Feeling, Somatization, Performance-Difficulty, Fear-Anxiety, and Depression), and 4 clinical clusters (Anxiety, Depression, Anger-Hostility, and Obsessive-Compulsive-Phobia) and a total score (6), (4) *Patient Overall Rating Scale* (completed at 2, 4, and 6 weeks), a 7-point scale on which the patient rates at each visit his global improvement since the beginning of treatment; and (5) *Disposition Form*, including both physician and patient endpoint ratings of drug efficacy, as well as patient disposition and drug preference ratings, and completed by the physician at the last patient visit.

## RESULTS

### *Attrition*

Ninety-six patients completed at least four

weeks of treatment. Eighty-one per cent of these same patients returned for a six week visit. Slightly more patients treated with thiothixene (42 per cent) dropped out before completing four weeks of treatment than patients treated with thioridazine (35 per cent) or placebo (35 per cent).

Also, regardless of medication, GP patients (44 per cent) dropped out slightly more frequently than clinic patients (32 per cent). Forty-two patients failed to complete four weeks of treatment of their own volition and 17 were dropped by their physician. The most frequent reason given for discontinuing medication was the onset of side effects.

### *Side effects*

The percentages of patients reporting side effects for five major side effect clusters are given in Table II for the two, four, and six-week treatment periods. All symptoms associated with drug intake and reported spontaneously to the physician were defined as side reactions and grouped into several major clusters. Only during the first two weeks of treatment did side effects differ significantly as a function of medication in the sedative ( $\chi^2 = 9.44$ , d.f. 2,  $p < .01$ ) and miscellaneous clusters (i.e. headaches, dizziness, faintness) ( $\chi^2 = 11.46$ , d.f. 2,  $p < .01$ ), and in the total number of patients reporting side effects ( $\chi^2 = 11.73$ , d.f. 2,  $p < .01$ ). Extrapyramidal side effects (i.e. CNS cluster) occurred only in a very low percentage of patients and were reported after two weeks of

TABLE II  
*Percentage of patients reporting side-effects at several treatment periods*

|                                   | Thiothixene       |                   |                   | Thioridazine      |                   |                   | Placebo           |                   |                   |
|-----------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                                   | 2 weeks<br>(N=38) | 4 weeks<br>(N=30) | 6 weeks<br>(N=25) | 2 weeks<br>(N=45) | 4 weeks<br>(N=33) | 6 weeks<br>(N=26) | 2 weeks<br>(N=43) | 4 weeks<br>(N=33) | 6 weeks<br>(N=27) |
| Sedation .. ..                    | 37                | 30                | 28                | 47                | 39                | 31                | 16                | 27                | 29                |
| Stimulation ..                    | 21                | 23                | 20                | 22                | 6                 | 8                 | 14                | 9                 | 11                |
| Central nervous<br>system .. ..   | 9                 | 7                 | 8                 | 8                 | 0                 | 0                 | 9                 | 0                 | 4                 |
| Autonomic nervous<br>system .. .. | 21                | 17                | 20                | 33                | 33                | 23                | 26                | 21                | 7                 |
| Miscellaneous ..                  | 21                | 20                | 20                | 47                | 24                | 19                | 16                | 12                | 22                |
| Total .. ..                       | 55                | 57                | 56                | 76                | 58                | 46                | 40                | 39                | 48                |

treatment by equal percentages of drug and placebo patients.

Thioridazine produced the most and placebo the least amount of side effects. GP patients reported slightly more side effects than clinic patients, but this difference did not reach significance. Table III gives the side effects

TABLE III  
*Most frequently reported specific side effects at 2 weeks*

|                   | Thio-<br>thixene<br>(N=38) | Thio-<br>ridazine<br>(N=45) | Placebo<br>(N=43) |
|-------------------|----------------------------|-----------------------------|-------------------|
| Drowsiness ..     | 11                         | 20                          | 6                 |
| Dizziness ..      | 7                          | 8                           | 5                 |
| Insomnia ..       | 6                          | 6                           | 4                 |
| Excitement ..     | 5                          | 7                           | 2                 |
| Dry mouth ..      | 2                          | 11                          | 4                 |
| Blurred vision .. | 2                          | 4                           | 0                 |
| Headache ..       | 3                          | 9                           | 4                 |
| Weight gain ..    | 2                          | 6                           | 0                 |

most frequently reported at two weeks, and indicates again that thioridazine produced more side effects, particularly drowsiness and the autonomic side effect, dry mouth, than thiothixene.

#### *Clinical improvement and population*

Data were initially analysed using a factorial (3 drug  $\times$  2 population) analysis of covariance procedure providing main drug, main population, and drug  $\times$  population interaction effects. Included in these analyses were two, four and six week data as well as six week endpoint data including all patients with two or four week scores for the Physician Questionnaire (PQ) and the Symptom Checklist (SCL) and all patients with ratings of global improvement at treatment endpoint. Since no consistent or significant drug  $\times$  population interactions were observed, data from both populations were combined and results will be discussed only in terms of main drug effects. A few significant main population effects occurred, primarily at four weeks, always showing GP patients, irrespective of medication, to improve more than clinic patients.

Since significant main drug treatment effects were not present during later evaluation periods,

only two week data are presented in Table IV. The tendency for both active compounds to produce more improvement than placebo reached significance in the PQ Anxiety item, the SCL Anxiety and Depression clusters and Fear-Anxiety factor, and the physician two week global improvement rating. Since these drug-placebo differences are not particularly marked and are not supported by PQ, SCL, or global improvement data analysed for several later time periods, their clinical significance has to be questioned. It should also be mentioned that several preference ratings made at treatment endpoint, e.g. whether the patient would like to continue on the same medication and how he liked the study drug compared to his previous drug, showed the three treatment agents to be almost identical.

#### *Clinical improvement and diagnosis*

We also used a factorial design to examine the effect of diagnosis (anxiety reaction *vs.* mixed anxiety-depressive reaction) on treatment response. No differential effect of diagnosis on treatment response was observed for the 90 patients included in this four week analysis. Occasionally there was a significant main diagnosis effect, showing patients diagnosed as having a primary anxiety reaction to improve more than patients diagnosed as having a mixed anxiety-depressive reaction.

#### *Clinical improvement and previous treatment response*

Since the present study included a particularly high percentage of previously treated patients with only a fair or poor response to psychiatric medication, we next tested, within a factorial design, for the effect of previous treatment response on treatment outcome. And, indeed, significant main previous treatment effects occurred (e.g. SCL total score,  $F = 8.55$ , d.f. 1,84,  $p < .005$ ). Consistently, patients on all three treatment agents improved less when they had a poor or fair previous response than when they had either a good response or no previous drug experience.

#### *Clinical improvement and initial psychopathology*

Since clinicians frequently believe that phenothiazines may be particularly useful in more

TABLE IV  
*Clinical improvement after 2 weeks of treatment*

|                                           | Pre scores | Adjusted post-treatment means |              |         | F-ratio       |
|-------------------------------------------|------------|-------------------------------|--------------|---------|---------------|
|                                           |            | Thiothixene                   | Thioridazine | Placebo |               |
| Patient symptom checklist<br>(Range 1-4)† |            | (N=36)                        | (N=40)       | (N=37)  | (d.f. 2,106)  |
| <i>Clusters</i>                           |            |                               |              |         |               |
| Anxiety .. ..                             | 2.12       | 1.79                          | 1.84         | 2.01    | 2.69*         |
| Depression .. ..                          | 2.17       | 1.78                          | 1.89         | 2.01    | 2.83*         |
| <i>Factors</i>                            |            |                               |              |         |               |
| I. Neurotic feelings ..                   | 2.21       | 1.82                          | 1.87         | 2.03    | 2.08          |
| II. Somatization .. ..                    | 1.98       | 1.74                          | 1.76         | 1.88    | 1.69          |
| III. Cognitive performance                | 2.04       | 1.83                          | 1.94         | 1.89    | 0.39          |
| IV. Depression .. ..                      | 2.20       | 1.81                          | 1.87         | 1.88    | 0.24          |
| V. Fear-anxiety .. ..                     | 2.28       | 1.86                          | 2.04         | 2.18    | 2.72*         |
| Total score .. ..                         | 2.12       | 1.80                          | 1.88         | 1.96    | 1.87          |
| Physician questionnaire<br>(Range 1-7):†  |            | (N=36)                        | (N=41)       | (N=39)  | (d.f. 2,106)* |
| <i>Clusters</i>                           |            |                               |              |         |               |
| Emotional .. ..                           | 3.90       | 2.91                          | 2.98         | 3.18    | 1.11          |
| Somatic .. ..                             | 3.55       | 2.68                          | 2.79         | 3.01    | 1.64          |
| <i>Items</i>                              |            |                               |              |         |               |
| Anxiety .. ..                             | 5.28       | 3.55                          | 3.82         | 4.20    | 3.44**        |
| Depressed mood .. ..                      | 4.24       | 3.15                          | 3.15         | 3.54    | 1.45          |
| Total score .. ..                         | 3.73       | 2.80                          | 2.88         | 3.10    | 1.78          |
| Physician rating of global improvement:   |            | (N=35)                        | (N=40)       | (N=39)  | $\chi^2$      |
| Mild, moderate, marked ..                 |            | 27                            | 31           | 21      | 6.65**        |
| None, worse .. ..                         |            | 8                             | 9            | 18      |               |

† Lower score indicates more improvement.

\*  $p < .10$ .\*\*  $p < .05$ .

severely ill anxious patients, we conducted further two and four week analyses of covariance testing for the effects of initial psychopathology level on treatment outcome. First, we conducted two factorial analyses, with patients divided at the median according to their scores on the SCL Anxiety cluster and on the SCL total score. Contrary to our expectations, initial level had no differential effect on treatment outcome. When occasional significant main illness effects occurred, they indicated that the less sick patients improved more, irrespective of medication, a finding frequently observed with placebo or weaker drug treatment. Second, we conducted analyses testing for possible heterogeneity of regression among the three medication groups and found no differences in any of the tested treatment periods. Thus we have a

strong indication that levels of initial anxiety and total neurotic psychopathology had no bearing on treatment outcome in this study.

We then tested for the effect of initial level of secondary depression on treatment outcome, since both thiothixene and thioridazine have been claimed to possess at least some antidepressant properties. A factorial analysis, with all patients divided at the median of the PQ depressed mood item into high and low levels of secondary depression, indicated a weak trend, reaching significance primarily in global ratings, for thiothixene and thioridazine to produce more improvement in high than in low depressed anxious patients. Interestingly, placebo response was much less affected by initial level of depression. These results are illustrated in Fig. 1 for the patient global



treatment endpoint rating. Similarly, a factorial analysis with patients divided at the median on the SCL Depression cluster yielded a few significant or trend effects, primarily at two weeks, in several SCL factors and in its total

score. Again, both thiothixene and thioridazine produced most improvement in those anxious patients who had concomitant depression, while the reverse was true for placebo.

*Clinical improvement over time (repeated measurement analysis)*

Having found only relatively few significant treatment differences, and these primarily only after 2 weeks of treatment, we were interested in whether or not a repeated measurement analysis would prove more sensitive than the covariance analyses discussed so far. Accordingly a repeated measurement analysis (1), using only those patients ( $N = 71$ ) who had pre-treatment and two, four and six week data, was conducted with the PQ Emotional and Somatic clusters, the PQ Anxiety and Depressed Mood items, and the 5 SCL factors as improvement criteria. Significant improvement over time ( $p < .01$ ), irrespective of treatment agents, was observed in all outcome criteria. In addition, drug-placebo differences as a function of time occurred in the PQ Anxiety item ( $p < .04$ ) and the SCL General Neurotic Feeling ( $p < .06$ ) and Fear-Anxiety ( $p < .004$ ) factors. As seen in Fig. 2 for the 2 SCL factors, our repeated

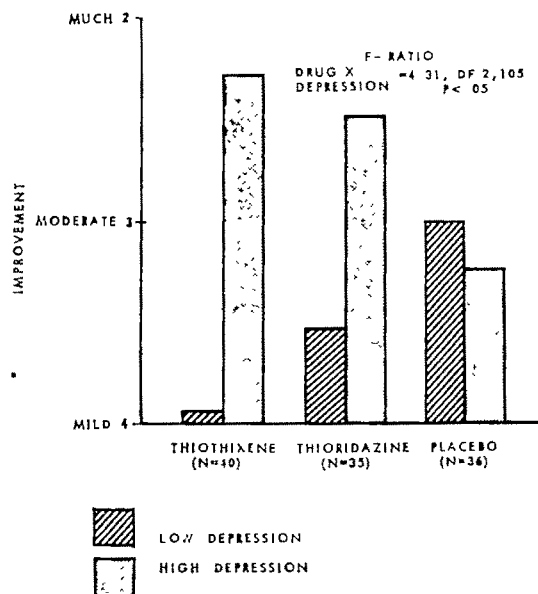


FIG. 1.—Patient rating of global improvement at endpoint as a function of initial level of depression ( $N = 111$ ).

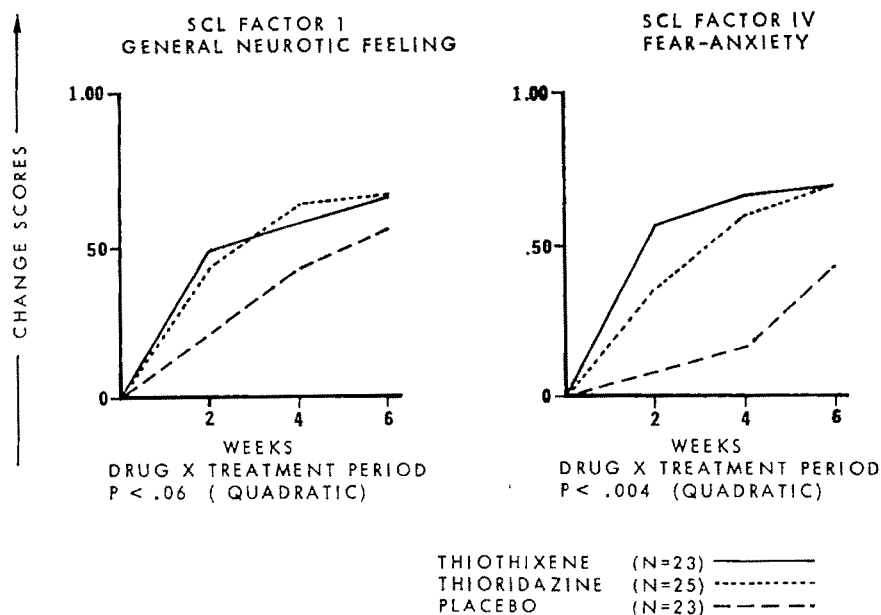


FIG. 2.—Clinical improvement over time (repeated measurement design).

measurement analysis supports our covariate analyses in indicating largest differences between treatments after two weeks and smallest differences after six weeks of treatment. Repeated measurement data have to be interpreted with caution since they involve only those patients who persevered in treatment for six weeks.

#### DISCUSSION

It is of interest to note that both populations participating in this study, the lower socio-economic class, more somatic psychiatric clinic patients, and the higher socio-economic class, less somatic general practice patients, responded similarly to the three study medications, i.e. no drug  $\times$  population interaction effects were observed.

Comparing the three treatment groups irrespective of population, we find only little evidence of any superiority of thiothixene and thioridazine over placebo. Main drug effects were significant at the two week period only, and not after four or six weeks of treatment. When one compares the findings of this study with results obtained in controlled studies with such anti-anxiety agents as chlordiazepoxide and diazepam (2, 11), less significant drug-placebo differences are certainly observed in this study.

It is of further interest that diagnosis (anxiety *vs.* mixed anxiety-depression), response to previous drug treatment, and level of initial anxiety and overall neurotic psychopathology failed to affect treatment response in this study differentially. Yet main effects did occur. Regardless of medication, patients improved more when they were diagnosed as primarily anxious, had a good previous drug response or no previous drug treatment, and were lower in initial anxiety and neurotic psychopathology. In contrast, initial level of secondary depression did exert at least some differential effects on treatment response. More depressed anxious patients improved more with thiothixene and thioridazine than less depressed anxious patients, at least according to a few outcome criteria. Thus present results failed to confirm the hypothesis that anti-psychotic agents are most effective in initially more severely ill and more

anxious patients. On the other hand, they tended to confirm reports in the literature indicating at least some antidepressant properties for both compounds (4, 7, 8, 9, 17).

As these data on clinical improvement indicate, both drugs appeared very similar in their therapeutic effects. While thioridazine initially produced slightly more side effects than thiothixene, these differences disappeared in later treatment periods. Extrapyramidal side effects occurred only rarely with either drug, but thioridazine, interestingly, caused slightly more anticholinergic and sedative effects than thiothixene. Could it be that the initial dosage of thioridazine used in this study was too high for some patients?

Before closing, it should be pointed out that the relatively high percentage of present study patients with a fair to poor previous drug response (i.e. 70 per cent of all previously treated patients) was found not to be atypical for clinical trials involving neurotic out-patients treated with anti-psychotic agents. Poor to fair previous drug response was reported for 66 per cent of 148 pre-treated neurotic patients from two earlier trials involving the anti-psychotic agents haloperidol (14) and clomacran (13) but only for 54 per cent of 484 pre-treated patients from three earlier clinical trials involving such minor tranquilizers as hydroxyzine, chlordiazepoxide, and diazepam (2, 10, 11).

Further investigation disclosed that the tendency for physicians to assign more treatment-resistant patients to clinical trials with anti-psychotic agents is particularly marked in general practice. Thus, fair to poor previous drug response was found in only 43 per cent of general practice patients assigned to minor tranquilizer studies (2, 10, 11), but in fully 70 per cent of general practice patients assigned to studies involving anti-psychotic agents (13, 14) ( $\chi^2 = 115.23$ ,  $p < .001$ ). In contrast, similar percentages of psychiatric clinic patients with fair to poor previous responses were found in trials with minor tranquilizers (60 per cent) and with anti-psychotic agents (64 per cent).

Several factors help to account for these findings. First, clinic psychiatrists encounter larger numbers of treatment-resistant patients than do general practitioners and are thus less

likely to draw distinctions in assigning patients to clinical trials. Second, it is at least conceivable that general practitioners place somewhat greater emphasis on clinical and somewhat less emphasis on research considerations than do clinic psychiatrists in making their patient assignments. It is also possible that there is simply greater bias against anti-psychotic agents in general practice than in a psychiatric clinic research setting.

Since the law requires that physicians should know which drugs are involved in controlled trials, the tendency, particularly among general practitioners, to assign more treatment-resistant patients to clinical trials with anti-psychotic agents seems likely to continue. On the one hand, it seems possible that this tendency contributes to the poor results generally obtained with anti-psychotic as compared to anti-anxiety agents in clinical research. On the other hand, the results of trials characterized by this tendency may be considered meaningful, since physician bias in patient assignment seems to reflect actual prescribing patterns for anti-psychotic agents in general practice.

In conclusion, then, the data indicate rather weak anti-anxiety properties for both anti-psychotic compounds, observed in selected two week measures of improvement. Treatment effects became slightly more significant when testing data from patients who completed all six weeks of treatment in a repeated measurement design. Again, however, the quadratic effects obtained indicated largest drug-placebo differences at two weeks and smallest differences at six weeks. Finally, we found evidence of at least some antidepressant properties for both active agents. In view of these far from impressive results, the clinician may want to consider the use of thiothixene and thioridazine, in the dosages employed, only in those anxious or anxious-depressed patients who have failed to respond to the more standard anti-anxiety drugs.

#### SUMMARY

A total of 155 anxious neurotic out-patients participated in this double-blind drug trial of thiothixene, thioridazine, and placebo. Ninety-six patients completed at least four weeks of

treatment. Thioridazine produced the most and placebo the least amount of side effects. A few significant trends for both active drugs to produce more improvement than placebo appeared after two weeks but not after four or six weeks of treatment. Even at the two week period, however, treatment differences were somewhat less than those usually observed with anti-anxiety agents. One reason for this finding may be the tendency, observed in this and in other studies, for physicians to assign more treatment-resistant patients to trials involving anti-psychotic than to those involving anti-anxiety agents. While initial level of anxious and overall neurotic psychopathology had no differential effect on treatment outcome, initial level of secondary depression had a mild effect, both drugs producing more improvement in the initially high than in the initially low depressed anxious patient. Thus, unless further research, which we hope may be conducted with less treatment-resistant patients, refutes the present findings, the usefulness of thiothixene and thioridazine as anti-anxiety agents must be considered to be at best rather limited.

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## The Relationship Between the Effect of Lactate Infusion on Anxiety States, and their Amelioration by Carbon Dioxide Inhalation\*

By M. T. HASLAM

### INTRODUCTION

Anxiety is perhaps one of the commonest and most disabling symptoms in medicine, yet its satisfactory alleviation has been elusive.

Work by Kluver and Bucy (1939) suggested that the amygdala generated anxiety, the function of the hippocampus being to decrease it. The hypothalamus appears to organize the level of arousal through the amygdala.

Furthermore, Birkmeyer (1970) has shown a correlation between muscle tone and anxiety. There is an increase in forearm blood flow (Fox and Edholm, 1963). Abnormally high levels of epinephrine are found in anxiety and this might lead to an increase in the level of lactate, which Cohen and White (1950) have shown is produced in excess in patients suffering from anxiety neurosis. Lactate is raised in standard exercise tests in this group, and characteristic symptoms of anxiety have been shown to occur concomitant with this rise.

Pitts and McClure (1967) have shown that an infusion of lactate may induce typical anxiety attacks in psychoneurotics which are not found with infusions of glucose or saline under identical conditions. They suggest this may imply that anxiety symptoms have a common determining biochemical end mechanism involving the complexing of ionized calcium at the surface of excitable membranes by lactate ion produced intracellularly.

Carbon dioxide inhalation has been known to medicine for many years as an effective method of treatment in some cases exhibiting anxiety (Meduna, 1956; La Verne, 1953; Wolpe, 1958).

Carbon dioxide increases acidity, in contrast to the alkalinity produced by lactate infusion,

and brain lactate levels have been shown to be reduced during CO<sub>2</sub> inhalation (Bain and Kleine, 1948). Gellhorn (1953) noted that high concentration of carbon dioxide reduced hypothalamic activity and induced muscle relaxation.

Thus it appears that on the one hand anxiety can be induced by lactate infusion in some cases, and on the other that carbon dioxide inhalation can reduce anxiety in some cases. It is hypothesized that in those patients who suffer from anxiety attacks and show a positive reaction to lactate infusion, carbon dioxide inhalation will be an effective method of treating the anxiety state, and the reverse will also apply.

### MATERIAL AND METHOD

Sixteen patients were placed on the trial on the basis of a complaint of anxiety, and a score of >30 on the fear schedule (Snaith, 1968). Patients were between 20 and 50 years of age and were rated on the schedule, which is a self-administered rating scale, prior to starting the trial.

The patients all showed symptoms either of pervasive anxiety or of phobic anxiety of agoraphobic type. Monosymptomatic phobic states were not included, as their scores would have been too low on the scales used. The duration of symptoms was variable from six months to over five years.

During the trial period and for a week beforehand anxiolytic medication other than night sedation was discontinued.

At the start of the trial an infusion was given of either lactate or glucose saline, on a blind basis allocated at random through the pharmacist. The patient was aware of the nature and purpose of the trial but not of the content of the particular infusion. The technique was identical to that described by Pitts and McClure (1967).

\* This paper is an abbreviated version of that presented to the World Psychiatric Association Conference, Mexico City, in November 1971.

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TABLE I  
Patient response to lactate, and to CO<sub>2</sub>

| Patient     | Anxiety score I | Lactate effect | Saline effect | CO <sub>2</sub> response | Anxiety score II | Positive result* |
|-------------|-----------------|----------------|---------------|--------------------------|------------------|------------------|
| 1 .. ..     | 64              | +              | —             | ++                       | 30               | +                |
| 2 .. ..     | 38              | +              | —             | +                        | 32               | +                |
| 3 .. ..     | 54              | —              | —             | +                        | 40               | —                |
| 4 .. ..     | 40              | —              | —             | —                        | 44               | —                |
| 5 .. ..     | 42              | +              | —             | ++                       | 20               | +                |
| 6 .. ..     | 34              | —              | —             | —                        | 24               | —                |
| 7 .. ..     | 32              | +              | —             | ++                       | 18               | +                |
| 8 .. ..     | 58              | +              | —             | +                        | 40               | +                |
| 9 .. ..     | 66              | +              | +             | +                        | 60               | +                |
| 10 .. ..    | 60              | —              | —             | —                        | 54               | —                |
| 11 .. ..    | 36              | +              | —             | ++                       | 28               | +                |
| 12 .. ..    | 44              | —              | —             | —                        | 40               | —                |
| 13 .. ..    | 40              | +              | —             | —                        | 60               | —                |
| 14 .. ..    | 32              | +              | —             | +                        | 20               | +                |
| 15 .. ..    | 58              | —              | —             | —                        | 44               | —                |
| 16 .. ..    | 40              | +              | —             | ++                       | 12               | +                |
| Total .. .. | 738             | 10             | 1             | 10                       | 566              | 9                |

\* By positive result is meant that both lactate response and CO<sub>2</sub> response occurred in the same subject.

Thus each subject received 10 ml./kg. body weight i.v. during a twenty minute period of either 500 mM Sodium D<sub>2</sub> lactate, or 555 mM glucose in 167 mM sodium chloride, designed to have similar osmolarities.

Four days later the other solution was given by i.v. infusion as before, and the results noted.

Regardless of response to lactate infusion, the patient was in the subsequent six weeks treated by a twice weekly course of carbon dioxide inhalation therapy using the method as described by Wolpe—a rapid induction technique using a 70 per cent carbon dioxide, 30 per cent oxygen mixture inhaled through three or four deep full inhalations, repeated three times over within a fifteen minute period.

The immediate effect in terms of the relief of anxiety feelings after inhalation was noted, as this was of particular theoretical interest. The overall effect of the course was noted by repeating the administration of the rating scales at the end of the six week treatment period. The results were then compared with the response, if any, that had been made to the two infusions.

### RESULTS

These are shown in Table I. Ten patients showed a positive response to lactate infusion in

that a panic reaction was provoked within a few minutes of starting the infusion, which ceased on discontinuing, and was repeatable. Of these ten, nine showed a good immediate response to the relief of anxiety symptoms subsequently with carbon dioxide inhalation. Six patients showed no panic reaction with either lactate or glucose/saline. One patient showed a typical panic response to both solutions. Only one of the six non-lactate responders appeared to find benefit from the carbon dioxide inhalation.

Thus 62 per cent gave an anxiety response with lactate, and 90 per cent of these found benefit subsequently from carbon dioxide inhalation therapy. The significance of these results is given in Table II, where  $\chi^2$  com-

TABLE II

|                                                  |
|--------------------------------------------------|
| No. of patients 16                               |
| No. of lactate +ve 10 = 62%                      |
| No. of these CO <sub>2</sub> +ve 9 = 90%         |
| $\chi^2 = 6.62$                                  |
| P = .01                                          |
| Initial anxiety score. Total 738                 |
| Final anxiety score. Total 566                   |
| Mean of first scores 46. S.D. = 11.3; S.E. = 2.8 |
| Mean of final scores 35. S.D. = 14.8; S.E. = 3.7 |
| t = 5.0                                          |
| P = 0.1                                          |



paring lactate positive/negative and carbon dioxide positive/negative response gives  $\chi^2 = 6.62$  ( $P = 0.01$ ).

A consideration of the overall scores showed that there was also a lasting improvement as measured by the self-administered rating scale, following completion of the carbon dioxide course—but this did not reach statistical significance when applied to the whole group. If the positive responders are compared with the negative responders,  $t = 2.4$  and  $P$  is  $0.1$ , which is also not significant.

#### DISCUSSION

There appears to be a positive relationship between those who react by panic attacks to lactate infusion, and a good initial response to carbon dioxide inhalation. The mechanism whereby this may occur has been touched on in the introduction, but further research would seem desirable to ascertain the exact relationship. In particular it would be interesting to see whether carbon dioxide administered at the actual time of the lactate-induced panic attack could prevent or alleviate it.

Pitts's and McClure's work has recently been repeated by Kelly (1971). He suggests that a rise of bicarbonate ion may be the key factor, and this would seem probable from the results of our study on carbon dioxide effect. Carbon dioxide may act as a lactate ion antagonist, and bicarbonate may be the relevant factor.

Wallace (1972) too has recently observed—while studying yoga—that during meditation carbon dioxide elimination is reduced. In his experiment at this time lactate decreased significantly from a mean of  $11.4$  mg. per  $100$  c.c. to  $6.85$  mg./ $100$  c.c. A feeling of restful tranquility during meditation appeared to correlate with the altered lactate level.

#### CONCLUSION

There exists a relationship between the development of anxiety attacks caused by lactate infusion, and its amelioration by carbon dioxide inhalation. The theoretical implications

of this require further study. Lactate infusion would appear to be a possible screening test for the type of anxiety which will benefit from carbon dioxide inhalation therapy.

#### SUMMARY

Anxiety is a common symptom, but is particularly present in the well delineated syndrome of 'anxiety state'. Excess lactate production has been shown to occur in some patients suffering from anxiety neurosis. Lactate infusion has been shown to induce anxiety in this group. Furthermore, carbon dioxide is known to alleviate anxiety in selected cases. An attempt to relate these two findings has shown a positive correlation between them. The relationship and possible mechanisms are discussed.

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## The Effects of Pulse ECT in Neurotic and Endogenous Depression

By M. W. P. CARNEY and B. F. SHEFFIELD

Convulsions induced by mild pulse current (Cronholm and Ottosson, 1963; Ottosson, 1960) have been reported to be as beneficial as unilateral or bilateral sinusoidal ECT in depression while not associated with as many undesirable effects (Valentine *et al.*, 1968). However, confirmatory work is needed, and the authors did not distinguish between response rates in neurotic and endogenous depression.

The present study attempted to investigate the response to pulse ECT in the two varieties of depression. We also compared the results obtained from the pulse-treated patients with those from 100 depressives consecutively treated with sinusoidal ECT immediately before the present study, 97 of whom were previously described (Carney and Sheffield, 1972). Though, on account of delays in obtaining equipment, the two projects did not run concurrently as originally intended, this may not have been completely disadvantageous, because the bias of the treatment teams in favour of sinusoidal ECT could have reduced the chances of a truly random allocation of patients between the two forms of ECT.

Moreover, we were influenced by ethical considerations. Because pulse ECT was relatively novel and untried we gave it to out-patients only, assuming—fallaciously as it later transpired—these to be less severely ill than in-patients. Again, because preliminary experience suggested that unilateral pulse ECT was not as efficacious as the bilateral form, we used only bilateral electrode placement. Furthermore, since the technique differs from sinusoidal ECT and we felt obliged to discuss the matter fully with the patients beforehand, some advantages of blindness were necessarily lost. Nevertheless we sought to provide independent checks of the results by asking the patients to

complete self-rating questionnaires and by having the clinical ratings completed by doctors not actually involved in giving the treatment.

### METHODS AND PATIENTS

Six or more pulse ECT (according to clinical need) were given by two teams (each of two doctors and their helpers, working independently of the assessing doctors), utilizing bilateral electrode placement and Duopulse equipment (low-power bi-directional pulses of current, 750 V peak-to-peak, with a repetition rate of 21.5/second).

There were 53 patients with a clinical diagnosis of endogenous depression (mean age 55.6, S.D. 5.1; range—17–82 years) and 22 neurotic depressives (mean age 44.1, S.D. 5.4; range—18–85 years) consecutively referred for out-patient ECT. The mean age difference is significant ( $t = 7.8$ ;  $P < 0.01$ ).

Neurotic depression was diagnosed when the following characteristics tended to predominate rather than 'endogenous' features (see below): inadequate premorbid personality; previous history of persistent, disabling neurotic symptoms; presence of adequate precipitants or psychogenesis; reactivity, variability and evening deterioration in mood; initial insomnia; self-pity; tendency to blame others; prominent anxiety, hypochondriasis, phobias, hysterical and other 'neurotic' features.

Endogenous depression was diagnosed when these features were prominent; adequate premorbid personality; history of previous episodes of depression or mania; absence of *adequate* precipitants and psychogenesis for the mood; quality of depression distinct from normal; terminal insomnia; morning aggravation; self-denigration; weight loss exceeding 7 lb.; psychomotor retardation and/or agitation.

In some cases this differential diagnosis was not easy and rested on the balance of probability.

One of three raters scored each patient one month after the ECT course on a four-point scale (A, socially recovered and symptom-free; B, socially recovered with residual symptoms; C, marked improvement but socially handicapped; D, trivial or no improvement); and on the first 17 items of Hamilton's (1960) scale before and one month after ECT. The second assessment was done without the aid of the previous assessment records. Twenty-nine depressives—15 endogenous (mean age 46.9, S.D. 16.8 years) and 14 neurotic (mean age 38.9, S.D. 14.1 years)—were also able (all were requested) to complete the Self-Rating Test (S.R.T.; Kellner and Sheffield, 1973) and Purpose in Life Scale (P.I.L.; Crumbaugh and Maholick, 1969). The mean age difference is not significant ( $P > 0.05$ ).

#### RESULTS

*Global ratings.* Analysis of the global outcome ratings (Table I) shows that more endogenous

TABLE I  
*Social recovery and type of depression*

|                          | Social recovery (A+B) | No social recovery (C+D) | Totals |
|--------------------------|-----------------------|--------------------------|--------|
| Endogenous depression .. | 38                    | 15                       | 53     |
| Neurotic depression ..   | 7                     | 15                       | 22     |

(72 per cent) than neurotic depressives (32 per cent) were socially recovered following treatment ( $\chi^2$  (corrected for continuity) = 5.08;  $P < 0.05$ ).

*Hamilton's ratings* (Table II). Though the categories did not differ significantly on mean pre-ECT scores, the mean fall after ECT of the endogenous depressives (15.83, S.D. 7.77) was significantly greater than that of the neurotic depressives (7.97, S.D. 10.63) ( $\chi^2 = 1.11$ ;  $P < 0.01$ ).

TABLE II  
*Type of depression and Hamilton's score*

|                          |  | Mean score $\pm$ Standard deviation |                 |
|--------------------------|--|-------------------------------------|-----------------|
|                          |  | Pre-ECT                             | Post-ECT        |
| Endogenous depression .. |  | 23.39 $\pm$ 5.01                    | 7.56 $\pm$ 6.93 |
| Neurotic depression ..   |  | 22.20 $\pm$ 4.03                    | 14.23 $\pm$ 6.9 |

*Self-ratings* (Table III). The endogenous depressives were significantly improved following ECT as measured by mean falls in S.R.T. number of symptoms ( $t = 2.69$ ;  $P < 0.02$ ) and total score—a combination of number and severity of symptoms and thus a measure of the patients' distress ( $t = 3.54$ ;  $P < 0.005$ ); and mean increase in P.I.L. score ( $t = 3.56$ ;  $P < 0.005$ ). Conversely, the neurotic depressives showed no significant changes in these scores following ECT.

*Number of ECT.* Though the endogenous depressives received significantly more ECT (mean 7.9; range 5–12) than the neurotic depressives (mean 6.4; range 6–10) ( $t = 4.8$ ;  $P < 0.01$ ), within the diagnostic categories there was no significant association between number of ECT and outcome. Thus this factor is unlikely to account for the superiority of outcome in endogenous depression.

TABLE III  
*Type of depression and self-rating tests*

|                        |  | Mean score $\pm$ Standard deviation |                 |                    |                 |                 |                    |
|------------------------|--|-------------------------------------|-----------------|--------------------|-----------------|-----------------|--------------------|
|                        |  | S.R.T. no. of symptoms              |                 | S.R.T. total score |                 | P.I.L.          |                    |
|                        |  | Pre-ECT                             | Post-ECT        | Pre-ECT            | Post-ECT        | Pre-ECT         | Post-ECT           |
| Endogenous depression  |  | 24.7 $\pm$ 6.8                      | 12.1 $\pm$ 9.1  | 56.3 $\pm$ 36.1    | 17.3 $\pm$ 14.9 | 85.9 $\pm$ 22.2 | 108.4 $\pm$ 21.4 * |
| Neurotic depression .. |  | 24.1 $\pm$ 5.8                      | 20.1 $\pm$ 10.7 | 52.4 $\pm$ 26.5    | 39.5 $\pm$ 27.3 | 78.3 $\pm$ 20.0 | 81.3 $\pm$ 26.7    |

*Pulse and sinusoidal ECT compared*

The sinusoidal ECT-treated depressives (65 bilateral and 35 unilateral) did not differ significantly from the 'pulse' group with regard to sex ratio (28 males and 72 females) or mean ages of the endogenous (56.7, S.D. 5.9) and neurotic (47.4, S.D. 5.0) depressives. Though the mean pre-ECT Hamilton's score of the 'sinusoidal' neurotic depressives (19.6, S.D. 4.72) was significantly lower than that of the 'pulse' neurotic depressives ( $t = 2.5$ ;  $P < 0.02$ ), their mean fall in Hamilton's score (11.4, S.D. 8.8) did not differ significantly from that of the latter. Similarly, though the mean pre-ECT Hamilton's score of the 'sinusoidal' endogenous depressives (20.2, S.D. 5.86) was significantly lower than that of the 'pulse' endogenous depressives ( $t = 3.1$ ;  $P < 0.005$ ), their mean fall in Hamilton's score (14.8, S.D. 7.86) did not differ significantly from that of the 'pulse' endogenous patients.

## DISCUSSION

This was not a controlled comparison of pulse ECT with other forms of ECT, and only the bilateral mode of electrode placement was employed. Our difficulties in trying to achieve methodological purity illustrate the problems of clinical investigation where it is most relevant—in the clinical context. Nevertheless, the validity of the findings is enhanced by the facts that the assessing and treating doctors worked separately from one another, later assessments were made without knowledge of previous assessment results and the Self-Rating results supported those of the clinical ratings. Despite the difference in time of treatment between pulse and sinusoidal ECT groups, there was sufficient resemblance between them to make some comparison possible.

The results indicate that pulse ECT is much more effective in endogenous than in neurotic depression—a difference in outcome not attributable to the greater mean number of treatments given the endogenous depressives. Furthermore, in endogenous depression pulse ECT is apparently not less beneficial than the sinusoidal form, despite employing only a fraction of the electrical power of the latter. This conclu-

sion ran somewhat counter to the impressions of the treating doctors who, perhaps unduly influenced by preconceptions of the advantages of the sinusoidal form and the poor response of the neurotic depressives to pulse ECT, were somewhat sceptical of its value.

If the benefits of ECT are mediated by the diencephalon (Roth, 1951) rather than by other parts of the brain, it is to be expected that only the minimum convulsant dose is necessary: and the effect should be more marked in patients with endogenous or physiological depression characterized by features of diencephalic disturbance (Pollit, 1965) than in others. Our results bear out these predictions, thus supporting the underlying hypotheses.

It might also be anticipated that unilateral pulse ECT would, as suggested by Valentine *et al.* (1968), constitute an additional refinement in treatment without loss of clinical benefit. However, though it is widely assumed that unilateral electrode placement is as effective as bilateral electrode placement without its more undesirable sequelae, Cannicott (1962) found that rather more unilateral than bilateral sinusoidal ECT were required for recovery, and we have noted a tendency for unilateral ECT—whether sinusoidal or pulse—to give poorer results than bilateral. Since this study was undertaken, Strömberg (1973) has published a similar finding. She carried out a study specifically designed to compare the merits of unilateral and bilateral electrode placement—the only such study of which we are aware—but all her patients were endogenous depressives. Unfortunately, most investigators of the effects of ECT (and of many of the biochemical correlates of depression) omit to state which kind of depression their patients had. This is regrettable in view of the undoubted relationship between type of depression and responsiveness to treatment. The combination of small groups and large statistical errors favours the null hypothesis (Costello *et al.*, 1970). Standard errors tend to be large because patients can get worse as well as improve with ECT. Thus there is room for a definitive study, employing large groups of patients, of bilateral and unilateral pulse and sinusoidal ECT in endogenous and neurotic depression.

## SUMMARY

Fifty-three endogenous and 22 neurotic depressives, given pulse ECT, were assessed before and after treatment on a four-point global scale and on Hamilton's Scale. Fifteen endogenous and 14 neurotic depressives also completed the Self Rating Test (S.R.T.) and the Purpose in Life Scale (P.I.L.). After ECT, significantly more endogenous (72 per cent) than neurotic depressives (32 per cent) were socially recovered, and the former showed a significantly greater fall in mean Hamilton's score than the latter. Unlike the neurotic depressives, the endogenous depressives also showed significant falls in S.R.T. number of symptoms and total score and increase in P.I.L. score. These results are taken to indicate that pulse ECT is beneficial in endogenous depression, and to support a diencephalic site of action for ECT.

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## Treatment of a Situational Phobia—A Case for Running

By ARNOLD ORWIN

Systematic desensitization using bodily responses other than relaxation as the specific anxiety inhibitor has produced positive results in phobic states. Jones (1924) used feeding, Wolpe (1969) advocated motor activity using a conditioned motor response, Ventis (1973) described a case where induced laughter was effective and Orwin (1971) paired the respiratory relief obtained after maximum voluntary respiratory arrest with the anxiety evoking stimuli. A derivation of this latter technique utilized the autonomic excitation caused by the vigorous physical exertion of running, to compete with the anxiety response in the agoraphobic syndrome (Orwin, 1973). This brief report describes an unusual situational phobia treated by this latter method ('the running treatment'), following previous experience with simple claustrophobia.

### CASE HISTORY

A young unmarried woman aged 24 years, was referred by her general practitioner with a phobia of high level lavatory cisterns. Apparently this fear had started at about 2 years of age when her mother took her to a public lavatory while on holiday. She recalled that this lavatory was frightening because it was dark and there was the sound of continuous running water above her head. She became very anxious and wanted to leave, but despite her screams her mother forced her to stay and micturate.

From then she developed a general fear of such lavatories and at first had some concern on using the lavatory at home. This anxiety gradually receded but was always exacerbated by redecoration or alterations to the lavatory, e.g. when on one occasion a new cistern had to be fitted. Her fear of public lavatories remained although subdued and she managed to cope with school lavatories.

Aged 9 years she was taken by an aunt into a public lavatory in the centre of a city and although urgently needing to micturate she refused to use the facilities. She was forcibly placed on the seat, but she

started screaming and had to be removed, having caused a considerable commotion. Thereafter, anxiety in school lavatories increased but was tolerated, for at this time she became aware that she would be extremely embarrassed if her phobia was revealed to her schoolfriends. The fear of public lavatories was aggravated and generalized so that by late adolescence she could not enter an unfamiliar lavatory with a high level cistern. Finally, she arrived at the stage where she could not go into any strange toilet suite until it had been surveyed by a friend in advance so as to be assured that cisterns were of the low level variety. This naturally hampered her social activities, for in new situations she had to be accompanied by at least one of the few friends who knew of her predicament. She had learnt that by imbibing enough whisky to make her carefree she could partially overcome her reluctance to approach an unknown lavatory alone, but if there was a high level cistern she would immediately leave in a panic.

Specifically, the most feared situation was of sitting below a cistern 60-100 cm. above her head where there were exposed pipes curved to overhang the person sitting below. She maintained that she was frightened of the cistern falling onto her head.

### TREATMENT

After the history had been taken she was asked to leave the consulting room for a physical examination in another part of the building and when recalled was made to sit in a chair by a window with a curtain partially drawn. The curtain concealed a detached lavatory cistern on the window sill level with her head, which had been placed there while she was out of the room. She was engaged in conversation for some minutes and then, to assess the intensity of anxiety, was told of the position of the cistern. She did not believe this at first but gradually became more anxious as realization dawned and fled in panic from the room when on being asked to draw back the curtains she discovered the feared object. After some encouragement she

composed herself and came back into the room to sit in a second chair about 4 metres from the cistern. She would move no closer to it and still portrayed and described considerable anxiety over her previous ordeal. She could not be prevailed upon to go back to the chair by the cistern and stated that if this was demanded of her she would have to leave.

She was then told she would be required to run until she was breathless and that on her return to the room she should endeavour to sit in this chair. She was also told that the effects of vigorous physical activity might prevent the detection of anxiety. Although dubious about this she left the building and ran three times along a measured 50 metres at her best speed. She then ran back into the consulting room and without difficulty and gasping for air reached for and fell gratefully into the first chair viewing the cistern without overt concern. As she recovered her breath she discovered that it no longer produced anxiety only a slight feeling of unease—which was quite endurable.

She returned one week later when the cistern was placed on a shelf so that it would be level with her head if she sat on an adjacent chair. After 100 metres sprint she again sat without anxiety. The cistern was then raised successively 5 cm. at a time for three more trials using the same technique and no anxiety was evoked. The following week the cistern was no longer supported on a fixed shelf but suspended by wire from an intravenous drip stand so that it was initially 15 cm. above her head. The running procedure was repeated and the cistern gradually raised till at the end of the sixth trial she could tolerate it 60 cm. above her for an indefinite period. This treatment session and those following were carried out by nursing staff.

On her fourth visit, a fortnight later, she was taken by a nurse to the vicinity of a public lavatory which she was told contained a high level suite and made to run towards it. She managed to reach the door, itself a considerable achievement, but then exhibited great anxiety possibly because she had not run as freely as before. However, the next week, after appropriate running she entered a hospital lavatory of a similar type and sat on the seat, first with the door open (2 trials) then with the door closed.

During the fourth trial she stayed and mic-turated but developed slight anxiety when she flushed the bowl. In the final session, following the same procedure, she entered the lavatory on five successive trials and on each occasion she sat for one minute and was able to tolerate flushing the bowl without anxiety. Thereafter she could use the lavatory without concern.

Progress: One month later she reported no difficulty in strange clubs, public houses or hotels. On follow-up after five months she retained her improvement.

### DISCUSSION

There is evidence to suggest that physical activity can be used to inhibit both reality-based and neurotic anxiety. Control of the former is probably best seen on the battlefield or in primitive religious ceremonies. In both circumstances psychological factors are involved and it would be difficult to dissociate the physical response from its particular emotional context but possibly the importance of muscular activity has been overlooked. In the soldier, fear may be contained by, for example, invoking patriotism, enthusiasm for the cause, the inspiration of the leader, and the confidence which emanates from the disciplined cohesion of an army, as well as the use of alcohol. But military history does seem to indicate that the raw militiaman, less able to control his emotions than the hardened soldier, had a better taste for a vigorous charge against the enemy than standing on the defensive awaiting attack. As examples we have the impetuous rush of the English fyrd against the veteran Dane (Oman, 1953) and the rapidly executed assault in column of the relatively untrained revolutionary French conscripts against well trained professional armies (Fuller, 1957). A parallel process appears to occur during the rites of many primitive religions. Sargant (1959) analysed the 'physiology of conversion' to a religious faith, and described the effect of rhythmic drumming, the development of emotional excitement often aided by various suggestive techniques and the use of alcohol and other drugs. In addition there was dancing to the point of physical exhaustion with feelings

of relief from sin and evil and presumably freedom from associated anxieties. Similarly it is generally agreed that for the tensions of everyday life, energetic activity, whether as exercise or sport, is beneficial, and following from this it has often been prescribed non-specifically as an adjunct in the treatment of neurotic anxiety.

From the behavioural point of view it is not difficult to see why muscular action may relieve anxiety, as normally it completes the fundamental biological pattern of arousal and anxiety mediated behaviour leading to avoidance which is dependent upon motor activity. One assumes that the autonomic nervous system runs synchronously with this reaction, there being a build up of internal drive interpreted cognitively as development of anxiety until successful avoidance occurs. At that time the discharge of muscular response leads to concomitant autonomic changes which are associated with and detected as freedom from anxiety, i.e. muscular activity is equated with an autonomic nervous system in a post anxiety or 'relief' state.

In the 'running treatment' this autonomic 'relief' state is proceeding at the time of the presentation of the anxiety stimulus. The anxiety response normally evoked is now probably inhibited at two levels: physiologically by competition from the metabolic demands of ongoing motor activity, and cognitively because despite the provocation anxiety cannot be detected in the prevailing autonomic excitation. Once this is experienced expectation of a similar anxiety-free response may arise in the future as shown by the work of Valins and Ray (1967) who indicated that avoidance behaviour can be altered by information concerning internal reactions.

Apart from the need to ensure that the patient was physically fit, no other problem emerged in treatment. The method was easy to use and imposed no undue strain on the patient, while the basic hypothesis as put to her was soon confirmed by her own responses. Consequently, motivation was high, as was expectation of a successful outcome, and she responded in five treatment visits. The investment of psychiatric time was small, for apart from the initial history, physical investigation, and supervision

of the first session, it was confined to monitoring progress and advising the nurse in charge on the hierarchy of situations.

Running as a form of treatment may have application in specific situational phobias as in agoraphobia. It is attractive because of its basic simplicity and the minimal demand on therapist time, but further research is necessary to determine its true value.

#### SUMMARY

The treatment of a specific situational phobia (of high level lavatory cisterns) is described. The method used was to utilize the autonomic excitation caused by vigorous muscular activity as an inhibitor of the situational anxiety. The patient was made to enter feared situations immediately after running close to the limit of toleration. The near lifelong phobia was removed in five short sessions with little psychiatric involvement. The method is attractive because of its basic simplicity, the rapidity of the response and the minimal demand on therapist time.

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## Synopses of Papers Awaiting Publication

### Control of Deviant Sexual Behaviour by Drugs:

**I. Behavioural Changes Following Oestrogens and Anti-Androgens.** By JOHN BANCROFT, GAVIN TENNENT, KYPROS LOUCAS and JAMES CASS.

A double-blind comparative study of the effects of cyproterone acetate (50 mg b.d.) and ethinyl oestradiol (0.01 mg. b.d.) on the sexual behaviour of sexual offenders is reported. Each drug was given for five weeks and compared with no treatment in a balanced design. Measures of frequency of sexual thoughts and orgasm, sexual attitudes and physiological and subjective responses to erotic stimuli were used.

There was no significant difference between the two drugs on any measure. Compared with no treatment they both significantly lowered the frequency of sexual thoughts and orgasms though the possibility of placebo effect cannot be excluded. They did not affect attitudes. A weak effect on physiological and subjective responses to erotic stimuli was found with cyproterone acetate only. Neither drug produced troublesome side effects.

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### Transcultural Influences on Psychiatrists' Rating of Verbally Expressed Emotion.

By J. P. LEFF.

The reliability exercises that formed part of the International Pilot Study of Schizophrenia were used to explore any possible differences between psychiatrists from the various centres in the way they perceived patients' verbal expression of emotion. It was found that psychiatrists from developed centres agreed with psychiatrists from developing centres in their perception of the degree of emotional differentiation shown by patients from developed centres. However, their ratings of patients from developing centres indicated a significant disagreement. Psychiatrists from developing centres saw these patients as exhibiting a relatively low degree of emotional differentiation, whereas their colleagues from developed centres rated them significantly higher in this respect. The possible reasons for this disagreement are discussed and it is concluded that the assessment

by the developing centre psychiatrists is more likely to be accurate.

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### Socio-Cultural Aspects of Attempted Suicide Among Women in Trinidad and Tobago.

By AGGREY W. BURKE.

This study describes the distribution of attempted suicide among the women of East Indian and African origin in Trinidad and Tobago. During a one year period there were 90 admissions for attempted suicide to the suicide prevention service. These cases were studied retrospectively in order to identify the probable role that socio-cultural factors might have had in their aetiology. The hypothesis of no difference in the distribution of this behaviour between the ethnic sub-cultural groups was not upheld. Though attempted suicide was about equally prevalent in both groups, the age group distribution was significantly different. Among those aged 10-24 there were more Africans than East Indians; at older ages the converse was true. There were, however, no differences in the distribution of a precipitating (preceding interpersonal dispute) or predisposing (formal psychiatric diagnosis of an affective disorder) factors. It is of interest that East Indian patients, who are often agricultural workers swallowed domestic agents more frequently than medicinal tablets, whereas the latter were preferred by the more urbanized African workers. Furthermore, the East Indian patients presented with fewer endogenous but more reactive symptoms than the African ones. The social aetiology in attempted suicide is discussed.

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### Disulfiram Implantation Critically Evaluated.

By M. T. MALCOLM, J. S. MADDEN and A. E. WILLIAMS.

Sixty-two alcoholic patients were treated by disulfiram implantation; in some cases the operation was repeated, so that results of 91 implants were

considered. Patients' reports of symptoms experienced on subsequent drinking were obtained, and it was found that typical disulfiram reactions seldom occurred. Even when symptoms were experienced they were rarely a deterrent to further drinking.

Blood disulfiram levels above 0.1 mg. % were invariably obtained in patients given oral disulfiram. On the other hand patients given disulfiram implantation seldom showed such a level, and if they did the level was not maintained after the first week. Carbon disulphide, which is a metabolite of disulfiram, was measured in patients' breath. The gas was found after oral therapy, but not after implantation.

It is suggested that the abstinence achieved after disulfiram implantation is due to the patients' unjustified fear of a reaction to alcohol. Since the implanted disulfiram appears inactive after the first post-operative week, it is probable that any symptoms that do occur when drinking are psychogenic. When patients come to realize the implant's inactivity its deterrent effect will be lost. Hence an alternative long-acting preparation of disulfiram would be desirable.

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#### **Evaluation of Ward Group Meetings in a Psychiatric Unit of a General Hospital.**

By JASON MARATOS and MARGARET J. KENNEDY.

Hour-long meetings involving both patients and staff were held in two 20-bedded wards of a general hospital. Each was followed by another meeting of staff only. A nine-week block of meetings was held in each ward alternately, so that each ward served as a control group for the other and for itself.

The effect was measured by the number of ward incidents considered sufficiently out of the ordinary by nursing staff to be entered on their records, by

scores on a Ward Atmosphere Scale, and by scores of patients and staff on a scale devised to elicit their attitude to ward meetings.

Results showed that in both wards there was a significant reduction in the number of incidents under experimental conditions. The reduction did not reflect a smaller number of patients causing incidents, but rather a smaller number of incidents per patient. The greatest reduction occurred in instances of refusing medication and absconding from the ward.

No significant changes were reflected in the Ward Atmosphere Scales, nor in the Patient's Attitude Scales. Staff attitudes changed in a negative direction in one ward and in a positive direction in the other.

The data are interpreted as suggesting that ward meetings, in providing an opportunity for verbal expression of hostility, prevent some of the non-verbal acting out of these feelings, and that previous training in psychotherapy or positive attitude of staff towards ward meetings does not appear necessary to achieve this effect.

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#### **The Gestation Period of Identity Change.**

By JAMES MATHERS.

This paper suggests that a period of about 18 months commonly elapses between a critical life experience and the change in the sense of personal identity which may result from it. Evidence for the hypothesis was found in observations of wartime soldiers after expatriation and repatriation and is supported by studies of widows and of patients leaving a psychiatric prison. Implications are discussed for the care of people who undergo critical life experiences.

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## Book Reviews

### H. SJÖBRING

**Personality Structure and Development.** By H. SJÖBRING. Copenhagen: Munksgaard. 1973. Pp. 204. No price stated.

When an internationally respected clinical and research psychiatrist undertakes to present a colleague's work to the English-speaking world, that work must be studied diligently, no matter that its author died some years ago virtually unknown outside his own country. In the introduction to this book, Erik Essen-Møller—co-editor of the original manuscripts and one of the translators—leaves no doubt that he believes that Henryk Sjöbring's teachings have had a remarkable influence on Swedish psychiatry and that they merit a wider audience. One can have no better recommendation.

Sjöbring, born in 1879, held the Chair of Psychiatry at the University of Lund from 1930 until his retirement in 1944, and was engaged in expounding his ideas from 1913 until shortly before he died in 1956. Sjöbring's views were therefore formulated and reformulated over the course of nearly half-a-century, and what comes through most clearly in this book is his philosophical approach to psychological and psychiatric problems. The work deals with three linked topics: firstly, the analysis of subjective experience and its possible neurophysiological basis; secondly, the nature of individual personality and its variation; and thirdly, the relationship between mental disorder and personality. It seems hardly necessary to say that discussion of these difficult problems does not make easy reading, and Sjöbring's arguments are sometimes difficult to follow, particularly when he speculates and then treats his speculations as if they were proven facts. Moreover, he uses many neologisms, but even so he writes with greater clarity than do many other philosopher-psychiatrists.

Sjöbring insists that the primary problem in psychology and psychiatry concerns the nature of subjective experience—the 'I' of each individual (presumably synonymous with the 'Existence', 'Dasein', 'Being' and 'Ground-of-all-being' of other writers). He describes the characteristics of the 'I'—its inherent striving and the variable qualities of that striving. He asserts that the 'I' first perceives, and that the perceiving changes in sequence to thinking, to deciding and finally to doing, and he speculates

that this train correlates with nervous activity in the sensorimotor cortex. That subjective experience may correspond with neurophysiological events is an idea attractive to many neuropsychiatrists (though it is of interest that Sherrington denied this possibility); but the nature of subjective experience remains a metaphysical issue, and Sjöbring's discussion serves mainly to ensure that we neither forget nor ignore it.

Sjöbring's views on personality and mental disorder are likewise based on introspection, clinical observation and intuition, and yet they have some resemblance to the sort of conclusions drawn by experimental psychologists such as Cattell and Eysenck, who based their ideas on the statistical analysis of objective observations. Sjöbring postulates four basic personality traits—'capacity', 'stability', 'solidity' and 'validity'—each of which appears to be analogous to the 'factors' revealed by more modern investigators of personality. Like these 'factors', Sjöbring's four basic traits are largely independent of one another and vary in strength between individuals. The total personality in an individual is partly the result of the interaction of these traits, but an important feature of Sjöbring's thinking is his postulate that pathological lesions (which he believes also contribute to mental illness) determine certain aspects of personality. Sjöbring's lesions comprise all that is abnormal in brain structure or function; they may be transient or permanent, anatomically based or humoral in origin, and they may be either genetically or environmentally determined. They manifest in various ways, depending in part on personality as well as on their localization and extent, and they can produce a wide variety of clinical syndromes.

It is extremely difficult to assess fully the value of this book. If one restricts oneself to asking whether it will stimulate others to formulate hypotheses which can be tested and so provide evidence for or against Sjöbring's views, one must conclude that there is at present hardly any scope for this, and hence that the book's value is slight. But this is a limited criterion of what is of value, and on other grounds it does seem important that Sjöbring's views (and others like his) should be kept alive, even if only until their scientific investigation is possible.

K. GRANVILLE-GROSSMAN.

### ENCOUNTER GROUPS

**Encounter Groups: First Facts.** By MORTON A. LIEBERMAN, IRVIN D. YALOM and MATTHEW B. MILES. New York: Basic Books, Inc. 1973. Pp. 495. Price \$15.00.

It would be a pity if this book was read merely to satisfy curiosity about encounter groups—admirably though it serves this purpose—because, directly and indirectly, it raises questions which are fundamental to the theory, practice and research of all the psychotherapies. Life was simple so long as encounter groups could be dismissed as a characteristically American phenomenon reflecting either the perpetual welcome for whatever is the latest or as a reaction to dissatisfactions. Things were simple when we could equate encounter groups with T- (for training) or 'sensitivity' groups which are easily understood and seem to have found a useful place in education and industry. Faced, however, with a plethora of apparently popular and unorthodox therapeutic techniques, and with colourful, evocative but vague names such as 'Gestalt' therapy, 'Transactional' analysis, 'marathon', 'psychodrama', 'Synanon', 'Esalen' and others, psychotherapists, both psychodynamic and behavioural, are forced to try and identify the challenge as a first step towards facing up to it. 'Encounter Groups: First Facts' is the first piece of systematic research which enables one to do this. It is a significant book and should be read by every psychotherapist.

A large group (over 200) of student volunteers were assigned at random to 18 encounter groups representing all the major current approaches and run by leaders experienced and respected within a given discipline (? anti-discipline). A smaller, matched control group was also used. Extensive tests and assessments were made on the participants at the start and finish of the research and at 6-month follow-up of something over half the cohort. The data are extensively analysed to answer, or at least throw light upon, most of the questions people might have of encounter groups: therapeutic results—successes, failures, dangers; comparisons of methods and of leaders; factors related to learning from the encounter situation and of maintaining such learning; factors relating to failure to learn. Aspects of the encounter mythology are examined, for example the accent on emotional release rather than cognitive consideration; and the place of structured exercises. Several chapters bring the research together and brief but interesting attempts are made to link it with other psychotherapy research. Different readers will find different suggestions and conclusions memorable or clinically useful. For me: that, like other psychotherapies, encounter groups have a

negative aspect. There was an 8 per cent 'casualty' rate plus a further 11 per cent of 'negative changes'; this is approximately double the overall negative impact for orthodox psychotherapies. However, encounter groups also have strengths: approximately one third of the students had made positive gains at termination, the majority maintained at follow-up. A number of the expectations from orthodox psychotherapy generally dismissed by the encounter cult, such as the need for cognitive as well as emotional 'work' and the importance of group influences on learning in addition to the influence of the leader, were confirmed as significant factors. Structured exercises did not prove powerful devices in adding to learning 'yield'.

One of the major overall conclusions from the research is that no easy generalization can be made about the value of encounter groups: the question remains, what sort of encounter groups are good (or bad) and for whom? This seems to echo the outstanding queries of all psychotherapies—individual, group, marital, family and behavioural—and can be elaborated further by asking the awkward questions: what sort of psychotherapy?, how long?, frequency?, 'depth?', what sort of therapist?, or a tape-recorder?, what is the importance of theory?, is the experienced therapist significantly more effective than the inexperienced?, what would be the implications of such findings for training therapists?, should the butter be spread thinner?, what are the cognitive, emotional and behavioural factors involved in the psychotherapeutic process? Almost none of the basic issues have yet been resolved convincingly, but Lieberman and his colleagues have shown in this research that it is possible to investigate these problems objectively for encounter groups.

There are of course limitations to this research, mainly epidemiological and statistical. Thus the use of students at a highly selective University (Stanford) rather than patients; the long-term follow-up loses about half of the starting sample; and there is the difficulty, despite extensive use of factor analysis and other statistical techniques, of purifying measuring instruments so that correlations and 'significant' differences can be interpreted.

The book raises the question whether it is possible, or why it is not possible, to do effective research on psychotherapy in this country. Potential researchers, not to mention potential funding agencies, should, however read and ponder the Preface to this book. Psychotherapy is a complex area which cannot be investigated on a shoestring. This book shows that given persistence complex problems may be overcome and touchy personnel, for example encounter group leaders, can be induced to co-operate. There is

a real need, at the present time, to find the most appropriate, effective and brief psychotherapies or combinations of psychotherapies.

SIDNEY CROWN.

### THE TAVISTOCK CLINIC

**Support, Innovation and Autonomy: Tavistock Clinic Golden Jubilee Papers.** Edited by ROBERT GOSLING. London: Tavistock Publications. 1973. Pp. vii+289. Index 9 pp. Price £4.60.

When the Tavistock Clinic celebrated its Golden Jubilee in 1970 several papers both from the Clinic and from Tavistock Institute of Human Relations were given at a meeting to illustrate the theme 'Attachment with Autonomy'. From those papers and other contemporary work this volume was constructed. The articles discuss the origins of autonomy and the influences which affect it in different settings, including child development, interpersonal relations, therapy and institutional and industrial life. The effort is inter-disciplinary, with the Editor making useful linking comments between the different sections.

The varied diet could only be of uniform appeal to those readers who are completely omnivorous but most readers will find at least several chapters rewarding. Bowlby offers food for thought in his discussion of exploratory behaviour and separation anxiety in infants. Miller and Gwynne discuss the problem of dependence in residential institutions for incurables and contrast the opposing ideologies which could be labelled as 'warehousing' or 'horticultural'. The warehousing attitude has as its ideal so many kippers laid out neatly tucked in a box, whereas the horticultural approach allows more room for individual preferences. An interesting model is proposed in which institutions can cater effectively for both psychophysical dependence and independence, with support systems for staff and inmates throughout these various interchanging roles. In a second study in chronic institutions Parkes makes a moving description of the problems in terminal care of patients with cancer. He describes the reaction of the patient to his predicament and the way in which this influences his relationships with relatives and staff. The institution itself as a social system is not the main topic. Parkes suggests the need for a new kind of professional whose role it is to work with and through members of staff to improve and support the fit between the institution and the patient. Further papers follow on marital and dyadic psychotherapy. Finally, there are intriguing sections on 'attachment'

in employment, the factors which decide whether people will be recruited in the first place, stay after joining, and take official or unofficial leave. Many interesting ideas arise out of this research by John Hill. Robert and Rhona Rappaport have original comments to make on family enabling processes. Their attention is devoted to husbands who enable wives to go out to work in dual-career families. They observe that past descriptions have usually been of disabling processes within family systems, and have been value-laden with destructive labels. A more balanced view may emerge from a study of enabling functions using a language free of unpleasant stereotypes.

Although the central theme of the book is rather laboured and its connection with particular chapters is sometimes tenuous, many sections are well worth reading in their own right. The book is suitable for psychiatric libraries, leaving readers to select chapters of particular interest to themselves.

ISAAC MARKS.

### EPIDEMIOLOGY

**Epidemiological Psychiatry.** By B. COOPER and H. G. MORGAN. Springfield, Illinois: Charles C. Thomas. Pp. 211. Price \$12.50.

This is an excellent book, and is recommended without reservation as the best short work available on epidemiological psychiatry. As noted in the foreword, the authors have 'provided a compact, lucid and authoritative review, which can be employed for educational purposes by teachers and pupils alike.' The plan of the book is admirably simple: the first chapter gives a brief account of the historical background, the second reviews problems of research methods, the next three deal with various aspects of the uses of epidemiology, and the final sixth discusses the impact of some modern techniques upon this new and expanding discipline. The three chapters on the uses of epidemiology, which really form the core of the book, deal with the planning of mental health services, the clinical applications of epidemiology, and the search for causes.

It is refreshing to read a book that is written critically but yet not destructively, and in which the authors maintain a uniformly high standard of writing. Its only weakness is not the fault of the authors; in a book trying to present an up-to-date picture of a rapidly expanding discipline there are practically no references quoted later than 1970, and it is now 1974. This unfortunate gap is due to the delays in publication that nobody can conquer but it means that a number of recent major studies, particularly con-

cerning the World Health Organization, were not available for comment when the proofs went to press.

The authors comment that they have not meant to produce a comprehensive textbook of epidemiological psychiatry and this is true, but yet the usefulness of their achievement can be judged by the fact that although there are only two hundred pages in the book there are brief and relevant comments on some 488 references. It is to be hoped that the authors can be persuaded to write a longer and more comprehensive work now that they have so clearly demonstrated that this new discipline is a lively and developing subject.

This book should become essential reading for both teachers and pupils in postgraduate psychiatric education, and it is clear and brief enough for keen undergraduates. Prospective purchasers should not be put off by the fact that it appears as one of a series entitled 'American Lectures in Living Chemistry'. These contents have nothing to do with chemistry as such, but the authors have made sure that the book is alive and likely to remain so for many years.

JOHN E. COOPER.

### PSYCHOPHARMACOLOGY

**Psychopharmacology: An Introduction to Experimental and Clinical Principles.** By LUIGI VALZELLI. 1973. Chichester: John Wiley. Pp. 271. Price £7.50.

The author sets out to provide an introductory textbook of psychopharmacology covering both basic experimental and clinical aspects of the subject. This task demands a breadth of knowledge which may be beyond the reach of a single author, and in the reviewer's opinion this book fails to reach a standard which makes it possible to recommend it either to pharmacology students or to psychiatrists in training. The presentation of the material is unsatisfactory, particularly in the general sections, e.g. Chapter 5 'Neurochemical Correlates of Behaviour', where the student is led rapidly through a maze of complex new factual material. Often several new concepts are dealt with in a single sentence. This sort of presentation is overwhelming, particularly when accompanied by numerous references without titles, given in such a manner in groups in the text that it is impossible to identify the exact subject to which they refer. This would lead to a good deal of frustration in any attempt to follow them up.

As regards individual sections, the book is best on

methodology, and weakest when dealing with clinical matters. A case might be made for the purchase of this book as an extensive, if frustrating, source of references, but certainly it has little to recommend it as an introductory text.

G. W. ASHCROFT.

**The Medical Use of Psychotropic Drugs** (report of a symposium sponsored by the Dept. of Health and Social Security, 1972). Edited by P. A. PARISH, W. M. WILLIAMS and P. C. ELMES, for the Royal College of General Practitioners. London: The Longman Group, Journals Division. Pp. 80. Price £1.75.

The objective of this conference, as set out in the introduction of the publication, was to look at the question: why are people looking for a solution to their troubles more and more confidently and commonly by taking drugs?

In the reviewer's opinion, the question is too general and vague to form the basis for a useful publication. These doubts are reflected in a comment from Professor A. L. Cochrane during one of the discussions (p. 41): 'I find it depressing to have been listening to lectures consisting entirely of statements of opinions'.

An example of the differences of opinion on important topics is seen with regard to the abuse potential of the benzodiazepines. On page 49, Dr. Peter A. Parish says, 'Admittedly the benzodiazepine drugs are reasonably free from abuse potential and are safe when taken in overdose'; on page 30, Dr. C. A. H. Watts in discussing the minor tranquillizers says: 'One or two in a crisis do no harm, but I suggest a week's supply after bereavement is about the upper limit . . . Longer courses are very hazardous and likely to produce drug-dependent patients'. A difference of opinion on a vital topic and yet no direct discussion resulted and certainly no suggestions were made on how it might be resolved.

A few of the speakers had done their homework and presented worthwhile data, e.g. Karen Dunnell on the extent and nature of medicine taking in selected groups; Michael Shepherd on 'The prevalence and distribution of psychological illness in general practice', and Professor O. L. Wade on 'Adverse reactions to psychotropic drugs'. I am sure that the participants gained from meeting others in different disciplines in discussion and exchanging views, but I doubt if it was fair to them to put their deliberations into print.

G. W. ASHCROFT.

## SZASZ

**The Second Sin.** By THOMAS S. SZASZ. London: Routledge and Kegan Paul. 1974. Pp. xiv + 121. Price £2.50 (cloth), £1.25 (paper).

**The Ethics of Psychoanalysis.** By THOMAS S. SZASZ. London: Routledge and Kegan Paul. 1974. Pp. v + 226. Index 3 pp. Price £4.00.

The position of Szasz between psychiatry and anti-psychiatry is well known; he is a firm believer in 'voluntary psychiatry', and a foe of 'involuntary' or institutional psychiatry. 'To confuse these is like confusing friend and foe, truth and falsehood, freedom and slavery, life and death', he says in his book of aphorisms called 'The Second Sin'. Voluntary or 'contractual' psychiatry 'comprises all psychiatric interventions secured for themselves by persons prompted by their own personal difficulties or suffering. These interventions are characterized by the retention of complete control by the client over his relationship with the expert. The most important economic characteristic of contractual psychiatry is that the contractual psychiatrist is a private entrepreneur, paid for his services by his client.' Szasz is very keen on the economic nexus; 'when people receive a psychiatric service without paying for it, they are the victims, not the beneficiaries, of psychiatry'. Needless to say Szasz opposes all diagnostic efforts; 'under the guise of diagnosing disease, the psychiatrist disqualifies deviance'. But anti-psychiatrists are no better. They are all 'self-declared socialists, communists, or at least anti-capitalists' who 'seek to raise the "insane" above the "sane"', and justify their aim by claiming that the "mentally ill" are authentic and honest, while the "mentally healthy" are inauthentic and corrupt. The motive of envy is now concealed by the rhetoric of "liberation" from capitalist psychiatric oppression'. These and other aphorisms are said (in the publishers' blurb), to be 'in the tradition of Pascal, La Rochefoucauld and Voltaire', and to strike 'at the heart of confusion, mystification, and humbug'. These are unfortunate comparisons; the fact that Szasz's style is not quite as awful as the usual American psychoanalyst hardly qualifies it to be compared with some of the great writers of all time.

Most psychiatrists who read *The Ethics of Psychoanalysis* will conclude that Szasz has never encountered the great mass of ordinary psychiatric patients who come as inpatients or outpatients to our hospitals and institutions, and that what he says may apply to a small number of well-heeled, well-educated WASPs, but is quite irrelevant to most neurotic and psychotic patients. He assumes the mantle of the religious prophet, rather than that of

the scientist; it is noteworthy that he never quotes facts or experiments, and that he never answers the many criticisms which have been made of his position. This does not mean that some of his criticisms of orthodoxy (particularly American orthodoxy) are not well taken; the complaint is that what he tries to put in its place is largely irrelevant. His books have one unusual virtue quite unexpected in an American psychoanalyst; they are mercifully short. Each book he has written, moreover, repeats what has been said before; this means that most readers will know all they have to know about Szasz by reading one book. There are few other writers who make one's labours so easy.

H. J. EYSENCK.

## FORENSIC

**Jail House Blues.** Edited by B. L. DANTO. Michigan: Epic Publications Inc. 1973. Pp. 325. Price \$8.95.

Very little has been published about the problem of suicide in prisons, yet, as this book illustrates, it is numerically a very serious medical problem. The editor has collected together some eighteen articles, one dealing with self-mutilation, three with descriptions of different kinds of American penal institution, and a number of somewhat bare head-counting exercises, mostly from America. The inmates' descriptions of the horrific and cruel circumstances in which they lived, especially the one describing 'The Not So Funny Farm', a hospital for the criminally insane, interested me most. The statistical studies showed the typical inmate who commits suicide to be an unattached male, often from a minority racial group, under thirty-four years of age. He usually kills himself by hanging, and does so within the first twelve weeks of his imprisonment. The editor describes four types of suicide, the despairing, the manipulative, the psychotic, and the over-aggressive. His prescriptions to remedy the situation are a bit trite, but certainly better than nothing: more recreational facilities in prisons, better training of officers, MMPI tests for all inmates, regular medicines for the sick, inmate patrols at night, weapon searches, more family contact. In places the book is extremely tedious, but it does give a useful guide to the literature. Furthermore it gives the uninitiated in the field a glimpse into the horror of imprisonment. Unfortunately it cannot even approach its lofty aim to be 'the book which can humanize jail and prison reform' because it never even questions the whole process of imprisonment, the editor himself rejecting alternatives to imprisonment before going on to give his prescriptions. Nevertheless a useful volume for a psychiatric library.

JOHN GUNN.



## CHILDHOOD

**Beyond the Best Interests of the Child.** By JOSEPH GOLDSTEIN, ANNA FREUD and ALBERT J. SOLNIT. New York: The Free Press (a division of Macmillan Publishing Co. Inc.). 1973. Pp. xiv+170. Index 7 pp. Price hardcover £4; paperback £1.

In this excellent book the authors, representing Yale Law School, the Hampstead Child Therapy Clinic and the Child Study Centre at Yale, argue convincingly the need for new guide-lines in disputes concerning child placement. They discuss the concepts of child-parent relationships, and provide working definitions of the 'psychological parent' who has day to day care of, and interaction with, the child but who may or may not be the biological parent; of the 'wanted child' and of the 'common law parent-child relationship' which has not been formalized in law as in adoption. They ask that the child in the dispute should be represented by independent counsel. The guide-lines offered are based on difference between the child's sense of time and that of the adult and on the need for continuity and for the 'least detrimental available alternative'.

The arguments are clearly expressed, and case illustrations are used to show how the suggested guide-lines would influence decisions. Footnotes with details of the cases cited are found at the end of the book. This is a concise, beautifully written book on a subject whose importance is not only being highlighted by publicized cases but is repeatedly confirmed in clinical practice. It is strongly recommended to all who may have a say in the placement of a child, particularly psychiatrists, social workers and lawyers.

ANN GATH.

## SCHIZOPHRENIA

**Schizophrenia: Behavioral Aspects.** By KURT SALZINGER. Chichester: John Wiley and Sons Inc. 1973. Pp. ix+181. Index 9 pp. Price £3.10 (cloth), £1.80 (paper).

'The purpose of this book is to present, in brief form, the behavioral theories and findings related to schizophrenia'. The book is aimed at 'students' but presumably with a wider public in mind, as simple medical terms are explained, often with surprising lack of precision, e.g. 'delusions (false beliefs supported by emotional factors)' 'dementia (impairment of mental powers)'.

'Schizophrenia is a unicorn' states the author, and spends much time criticizing current methods of describing and labelling the beast. He emphasizes particularly the lack of reliability and validity of diagnosis. He draws little distinction between diagnosis as commonly practised by clinicians and the

much higher reliability recently demonstrated by research groups using standardized methods of interview. The pioneering work of Spitzer and Endicott receives only fleeting mention, and that of the US/UK Diagnostic Project none—this is the more surprising as both groups share the same department of the same institute as Dr. Salzinger.

The descriptions of behaviour theory and the extensive review of the literature relating it to schizophrenia are useful. For whatever the 'cause' of schizophrenia may be—and Dr. Salzinger here falls back on the possibility that biological or environmental faults sensitize the individual—behaviour theory can offer some plausible explanations for the patient's symptoms.

However, in the end one is brought back to the question of diagnosis on which the value of the experimental work must rest. Dr. Salzinger seems to accept that of the mental hospital in which he is working and quotes hopefully from the Diagnostic and Statistical Manual II of the American Psychiatric Association, but the work being pursued presumably within walking distance of Dr. Salzinger's rooms has shown clearly that this clinical diagnosis is very variable. It is difficult to say what readers in Britain, for example, can make of those experiments in which the groups of patients are not described. Until Dr. Salzinger (and others in his field) makes a greater effort to define his diagnostic terms the value of his work and his book will remain impaired, and he and the reader will resemble the bemused hunters, as seen on the tapestries, of the mythical beast which he so tellingly invokes.

J. R. M. COPELAND.

## MENTAL HANDICAP

**New Perspectives in Mental Handicap.** Edited by A. FORREST, B. RITSON and A. ZEALLEY. Edinburgh: Churchill Livingstone. 1973. Pp. 235. Illustrated. Price £2.50.

This is an excellent small handbook by an Edinburgh multi-disciplinary team which marks a sharp departure from many outdated stereotypes in the assessment and care of the mentally handicapped. Dr. Ritson, who is consultant psychiatrist to Gogarburn and the Royal Edinburgh Hospitals, provides the introductory chapter on the concept of mental handicap and another chapter outlining the existing services. The paediatrician's role is set out by Dr. J. K. Brown, consultant to the Royal Hospital for Sick Children and Gogarburn. A chapter is contributed by a geneticist, and two nurses provide another section. A group secretary discusses changing patterns of organization and management, while the director of

the Edinburgh Department of Special Education deals with education. The contribution of the voluntary services is not forgotten. The volume concludes with a chapter on prevention. It is remarkable, however, that no psychologist is included in the team; all the more since so much of the stimulus for advance in the rehabilitation of the mentally handicapped has come from psychologists. The illustrations cover some of the clinical syndromes and their complications as well as exemplifying the habilitation and training programmes. The teaching value of the illustrative pedigrees shown would be improved if they were related to actual families with a known syndrome rather than being abstract.

B. H. KIRMAN.

**Mental Handicap and Community Care: A Study of Mentally Handicapped People in Sheffield.** By MICHAEL BAYLEY. London: Routledge and Kegan Paul. Pp. xxi-404. Price £6.50.

The author presents a detailed analysis of all mentally retarded (with an upper IQ limit of 70) who were on the books of the Sheffield Mental Health Services on 1 September 1968. The aim was to establish the needs of the retarded and their families and to explore ways in which community care can be based on local resources so as to maintain contact with families and friends. The author feels that, at present, inadequate use is being made of the contribution of relatives, friends and other members of the community both in home care and in residential units. He advocates fuller use of tax-free attendance allowances, transport facilities and services of social workers, voluntary organizations and home helps, though the latter particularly are in very short supply.

After examination of every aspect of community care and analysis of reasons for hospital admission, the author makes concrete and detailed suggestions for the integration of new services into those already provided by the Regional Hospital Board and Local Authority. Although the scope of the survey was primarily administrative, all those interested in mental retardation may benefit from this well-written book containing good reference lists, graphs and useful appendices.

W. WOLLEN.

#### COMMUNITY PSYCHIATRY

**A Society on the Run: A Psychology of Northern Ireland.** By RONA M. FIELDS. Penguin Education. 1973. Pp. 216. Price 50p.

The author is an American psychologist, and presents this book as the account of her 'research' in

Northern Ireland. It is in fact a piece of journalism, engaging, humane, vivid—but no more and no less 'scientific' than other good reporting on the current tragedy of Northern Ireland. She writes with compassion and much well-observed detail, but the frequent references to psychological testing seem to contribute little to this. There are odd comments about drugs, for the author not only describes but often appears to accept the apparently prevalent beliefs about the action of drugs administered to the inmates of detention camps; thus Librium, for instance, is referred to as having a specific action on the central nervous system to diminish sexual potency. That it is apparently widely believed in Northern Ireland that these drugs are able, and are intended, permanently to unman those who take them is a telling observation; but it hardly proves, as the author seems to assume, that both the pharmacological action and the intention exist. This is a partisan piece of writing and is all the better for that; but it should have been in the 'Penguin Special' series on active current issues rather than presented as a psychological text.

TOM ARIE.

**Social and Medical Problems of the Elderly.** By KENNETH HAZELL. Hutchinson. 1973. Pp. 298. Price £5.00.

This book is intended to increase interest in the problem of caring for the elderly, and according to the foreword is primarily intended for doctors. It includes a chapter on nursing care written by a nurse but in spite of its title I looked in vain for a chapter by a social worker.

Psychiatrists will not find this book helpful, and there are some aspects which may well antagonize the psychiatrist who begins to read it. Some of the phraseology referring to psychiatric practice has an old-fashioned ring. The description of the sort of ward a geriatrician might have to take over, which would include 'certified mental defectives' is more than out of date; it was only in an abortive Bill of about 1911 that senile dementals came under the heading of 'mental defectives'.

Lastly, in several places there is evidence of careless editing or proof reading. For example, when writing of Senile Psychosis—'It used to be thought that their prognosis was six months, but in fact it is now two years or more, and this is partly due to earlier admission to mental hospitals which in turn is partly due to the over-crowding of the stigma of "putting Mum away".'

A. A. BAKER.

## Books Received

### CHILDREN AND ADOLESCENTS

- Remember Maria.** By J. G. HOWELLS. *Butterworth*. Price 55p.
- Normal Adolescence: its Dynamics and Impact.** Formulated by the Committee on Adolescence—Group for the Advancement of Psychiatry. *Granada Publishing*. Price £3.00.
- Disturbed and Troubled Children.** Edited by M. F. FREEHILL. *John Wiley*. Price £6.65.
- The Flint Infant Security Scale; for Infants aged 3 to 24 months.** By B. M. FLINT. *Guidance Centre, Faculty of Education—University of Toronto*. Price \$1.55.
- Major Issues in Juvenile Delinquency—Report on a Symposium held in Bratislava 27–31st August 1973.** *Regional Office for Europe, W.H.O.* Not for sale.

### PENOLOGY

- Misuse of Psychiatry in the Criminal Courts: Competency to Stand Trial.** Formulated by the Committee on Psychiatry and Law of the Group for the Advancement of Psychiatry. Price \$3.00.

### DRUGS AND ADDICTION

- The Social Control of Drugs.** By P. BEAN. *Martin Robertson*. Price £3.95; £1.95 (paperback).
- The Cannabis Experience—An Interpretative Study of the Effects of Marijuana and Hashish.** By J. BERKE and C. HERNTON. *Peter Owen*. Price £4.50.
- Indian Drinking—Navajo Practices and Anglo-American Theories.** By J. E. Levy and S. J. KUNITZ. *John Wiley*. Price £7.00.

### PSYCHIATRY, PSYCHOTHERAPY AND PSYCHOANALYSIS

- Psychopharmacology in Family Practice.** By D. WHEATLEY. *Wm. Heinemann Medical Books*. Price £2.95.
- Practical Clinical Psychopharmacology.** By W. S. APPLETON and J. M. DAVIS. *Medcom Press*. No price stated.
- Psychotherapy To-Day.** Edited by V. VARMA. *Constable*. Price £4.50.
- Placebo Therapy.** By J. M. FISH. *Jossey Bass*. Price £4.50.
- The Human Circle—an Existential Approach to the New Group Therapies.** By C. GOLDBERG and M. C. GOLDBERG. *Nelson-Hall*. Price \$12.00.

- Minutes of the Vienna Psychoanalytic Society, Vol. III—1910–1911.** Edited by H. NUNBERG and E. FEDERN. *International Universities Press*. Price \$20.00.

- The Radical Therapist.** Edited by the Radical Therapist/Rough Times Collective. *Penguin Books*. Price 60p.

### MENTAL RETARDATION

- The Economics of Mental Retardation.** By R. W. CONLEY. *Johns Hopkins University Press*. Price \$15.00.

### OBSTETRICS

- Obstetric Therapeutics—Clinical Pharmacology and Therapeutics in Obstetric Practice.** Edited by D. F. HAWKINS. *Baillière Tindall*. Price £8.50.

- COMMUNITY, SOCIAL AND ALLIED MATTERS**

- Health and Illness: A Social Psychological Analysis.** By CLAUDINE HERZLICH. *Academic Press*. Price £3.80.
- Evaluating Treatment Environment—A Social Ecological Approach.** By R. H. MOOS. *John Wiley*. Price £8.90.
- The Work of the Welsh Hospital Board 1948–1974.** By M. RYAN. *Welsh Hospital Board*. No price stated.
- A Home for the Heart.** By B. BETTELHEIM. *Thames & Hudson*. Price £4.50.

### OLD AGE AND SUICIDE

- The Prediction of Suicide.** Edited by A. T. BROCK, H. L. P. RESNICK and D. J. LE HIERY. *Charles Press*. No price stated.
- Psychiatric Disorders in Old Age.** By J. A. WHITEHEAD. *Harvey Miller and Medcalf*. Price £1.80.
- Serving Mental Health Needs of the Aged through Volunteer Services.** *U.S. Department of Health, Education and Welfare*. No price stated.

### MISCELLANEOUS

- Creativity.** Edited by M. BLOOMBERG. *College and University Press*. Price \$12.50.
- Man-Machine Systems.** By W. T. SINGLETON. *Penguin Education*. Price 60p.

### FROM ABROAD

- Latino Mental Health—A Review of Literature.** By A. M. PADILLA and R. A. RUIZ. *National Institute of Mental Health*. No price stated.
- Die Erleuchtung im Zen-Buddhismus—Gespräche mit Meistern und psychopathologische Analyse.** By G. SCHÜTTLER. *Karl Alber*. Price \$1.95.

Many of these books will be reviewed at a later date

## Correspondence

*Letters for publication in the Correspondence columns should be addressed to:*

The Editor, British Journal of Psychiatry, Chandos House, 2 Queen Anne Street, London, W1M 9LE

### COGNITIVE FUNCTION IN PATIENTS ON LITHIUM THERAPY

DEAR SIR,

We have recently completed a double-blind controlled clinical trial of lithium carbonate in the treatment of patients with Huntington's chorea, and the results have been published elsewhere (Aminoff and Marshall, 1974). During the course of this trial, we found that lithium therapy caused a deterioration in the performance of patients in tests of cognitive function. Since lithium has an important role in the treatment of certain categories of psychiatric patients, we felt that it would be important to bring further details of these changes to the attention of your readers.

Nine patients with Huntington's chorea participated in the trial. Their clinical features, and the manner in which the study was performed, have been described in our original paper. Cognitive function was evaluated by two of us, without knowledge of the patients' medication, using eight sub-tests of the Wechsler Adult Intelligence scale. Each patient was assessed before commencement of the trial, after treatment with lithium, and after placebo medication.

Assessment of cognitive function at the commencement of the trial showed that the mean score for our series of patients on the Wechsler Full Scale IQ was 74.2 (range 66-92). All patients were considered to have some degree of intellectual deterioration from their pre-morbid level, as judged by their past educational and occupational histories. Fig. 1 shows the mean increments and decrements subsequently found during lithium and placebo medication in the scores for the eight sub-tests used in the assessment. The mean scores obtained in all sub-tests during lithium treatment were significantly lower than those obtained at the commencement of the trial and those found after placebo medication ( $p < 0.01$  in both cases for all sub-tests except for digit symbol, where the difference between scores after placebo and lithium treatment was significant at  $p < 0.05$  level). Statistical comparisons were made using the Wilcoxon matched-pairs signed-ranks

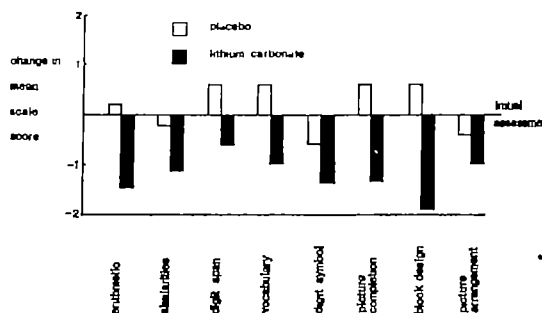


FIG. 1.

test. When the full scale IQ during lithium treatment was compared to that obtained during placebo medication for each patient there was a decrement in score which ranged from 0-16 points (mean 8.2).

In view of the possibility that the decrement in IQ score during lithium treatment was related to the degree of pre-existing dementia a Spearman rank correlation was calculated between the full scale IQ scores at the commencement of the trial and the subsequent drop in IQ points during lithium treatment, but no evidence of such a relationship was found ( $r = 0.16$ ). Similarly, there was no evidence of an association between the decrement in IQ during lithium treatment and the other medication that some patients were receiving.

Thus there is a reversible impairment of cognitive function during treatment with lithium carbonate in patients with Huntington's chorea. It may be that this occurs only in patients with pre-existing dementia, but the degree of intellectual impairment which we found with lithium was not related to the degree of dementia in our patients. It is, of course, well recognized that mental symptoms may occur as toxic manifestations of lithium therapy (Shopsin and Gershon, 1973) but there was no evidence of toxicity in our patients at the time of assessment. It may be, therefore, that the benefits of mood changes in psychiatric patients on lithium therapy have masked an underlying change in cognitive function which

occurs in the absence of clinical or laboratory signs of toxicity. Further studies are necessary to resolve this point.

M. J. AMINOFF, JOHN MARSHALL,  
EILEEN SMITH, MARIA WYKE.

*National Hospital for Nervous Diseases,  
Maida Vale Hospital,  
London, W.9;  
and the Institute of Neurology,  
Queen Square,  
London, W.C.1.*

#### REFERENCES

- AMINOFF, M. J. & MARSHALL, JOHN (1974) Treatment of Huntington's chorea with lithium carbonate. *Lancet*, i, 107-109.  
SHOPSIN, B. & GERSHON, S. (1973) Pharmacology—toxicology of the lithium ion. In *Lithium, its Role in Psychiatric Research and Treatment* (ed. Gershon, S. & Shopsin, B.), pp. 107-46. New York-London: Plenum Press.

#### EFFECT OF LITHIUM ON DISTURBED SEVERELY MENTALLY RETARDED PATIENTS

DEAR SIR,

We wish to report on the therapeutic effects of lithium salts on the disturbed behaviour in severely mentally retarded patients.

Ten patients (six male and four female) were selected for a trial period of twelve weeks to observe the therapeutic effect of 'Lithium Phasal'. All were severely mentally retarded and displayed aggressive and self-mutilating behaviour. Previous treatment with various tranquillizers and behaviour modification therapy had had little or no effect. Two of the patients were well controlled epileptics: The age of the patients ranged between 16 and 58 years and most of them had been in hospital for more than eight years. A simple rating scale was used to assess the patients' behaviour with regard to aggressiveness, self-mutilating tendencies, affectivity, social behaviour and personal habits. During the trial period the patients were assessed every two weeks.

Following a full general physical examination, 'Lithium Phasal' was administered in doses of 900 mg. daily, in addition to the existing medication which was not changed for at least three months preceding the trial. Subsequently the dose was adjusted according to the lithium plasma level. Lithium tests were done weekly for the first four weeks and fortnightly thereafter. Serum lithium was maintained between 0.6-1.4 mEq./L. No side effects were observed.

We found that five out of the nine patients who

had aggressive tendencies showed significant improvement. Three patients improved slightly and in one there was no change. The outbursts of aggressive behaviour became less frequent and easier to control. The therapeutic effect of lithium treatment was found more evident in patients whose main problem was self-mutilating behaviour. Six of the eight patients with such tendencies improved to a point where self-mutilation ceased. One patient improved mildly and one patient showed no improvement. It was also noted that all the patients became less irritable, and more co-operative, and developed an increase in their social tolerances.

The result of this pilot study suggests that lithium salts have a significant effect on the disturbed behaviour in severely mentally retarded patients. Our findings agree with the findings of T. Dostal and P. Zvolzki concerning anti-aggressive propensity of lithium, but we were surprised that self-mutilating behaviour responded even better.

We hope that these findings will stimulate further studies on the use of lithium in this field.

VITOMIR MIGEV.  
D. M. LYNCH.

*Turner Village,  
Mile End,  
Colchester, Essex.*

#### REFERENCE

- DOSTAL, T. & ZVOLSKI, P. (1970) Antiaggressive effect of lithium salts in severe mentally retarded adolescents. *Pharmacopsychiat.*, 5, 203-207.

#### ABRUPT WITHDRAWAL OF ANTIPARKINSONIAN DRUGS

DEAR SIR,

Referring to the paper by McClelland *et al.* (*Journal*, February 1974, 124, 151-9), I feel that the practice of prescribing antiparkinsonian drugs with neuroleptics, particularly with depot drugs, remains an important safeguard for patients, unless further and longer term studies confirm the authors' findings.

Their reported relapse rate of 8 per cent extrapyramidal symptoms is much lower than that found in previous studies, but only 9 per cent of the patients studied were taking chlorpromazine (or equivalent) in doses of more than 100 mg. three times daily. Patients aged over 70 years were excluded, but these form a large proportion of long stay in-patients, and their exclusion, combined with that of out- and day-patients, may prejudice the relevance of the study. While the deterioration of some patients taking antiparkinsonian drugs may be 'statistically non-significant' this statement could be less meaningful

than it appears. In the group of 27 patients receiving antiparkinsonian medication only one patient developed 'akathasia' compared with four in the untreated group, two 'oral dyskinesia' compared with five, and five 'lost arm swing' compared with eight respectively.

For most of us the possible long-term extrapyramidal side effects of neuroleptic drugs are more important than short term effects, and despite this study's excellent design and the care with which it was carried out a four-week period cannot be expected to shed much light on the long-term issues. Lastly, the side effects which the authors mention apply mainly to older drugs, e.g. benzhexol, and while one agrees that any unnecessary prescribing of antiparkinsonian drugs is wasteful of both time and money, it is important that there should be no unjustified throwing out of the baby with the bathwater.

PETER HALL.

*Powick Hospital,  
Powick,  
nr. Worcester, WR2 4SH.*

#### CHOREIFORM MOVEMENTS AFTER DEPOT INJECTIONS OF FLUPENTHIXOL

DEAR SIR,

I have two patients who have been treated with depot injections of flupenthixol and have developed choreiform movements. One, a man of 40 who has had schizophrenia for eight years, has been on 40 mg. flupenthixol intramuscularly every three weeks since August 1972. In June 1973 he changed his address without letting his community nurse know. In the autumn he was seen, quite by chance, in a dentist's waiting room by a member of our staff and was noticed to have obvious generalized chorea. This has since slowly and completely disappeared without any treatment. The other, a man of 28, has suffered from schizophrenia for seven years and has been treated with a large number of neuroleptic drugs. In November 1972 he was changed from intramuscular fluphenazine to flupenthixol, 40 mg. every two weeks. In August 1973 he developed extremely severe generalized chorea which affected his limbs more than his body and was not associated with oral dyskinesia. Later he developed athetoid as well as choreiform movements. His condition failed to respond to tetrabenamine, thiopropazate or thioridazine. It was only when he was started on lithium that some amelioration of his condition occurred.

In the two cases investigation excluded thyrotoxicosis and polycythemia; skull X-ray and brain scan

were normal, chest X-ray was clear and there was no family history of Huntington's chorea.

If one accepts the view that the tardive dyskinesia which patients show on neuroleptic drugs is due to upsetting of the balance of the dopaminergic-cholinergic transmitter system in the central nervous system, then it was only a matter of time before such an effect was likely to be seen with flupenthixol.

Attention is drawn to the irreversibility of the situation in one of the patients and to the fact that the patients are young, unlike those described previously who seem mostly to have been elderly females.

ALAN C. GIBSON.

*St. Ann's Hospital,  
Haven Road,  
Canford Cliffs,  
Poole, Dorset, BH13 7LN.*

#### WHAT SHALL WE DO WITH THE THE DRUNKENNESS OFFENDER?

DEAR SIR,

In their paper *Journal* (124, 327), H. I. Hershon *et al.* use the word 'decriminalize'. How soon will it be before we 'deschizophrenicize', 'dedepressivize', 'defrigidize' (or ? 'defrost') our 'clients'?

ALBERT WEST.

*St. Crispin Hospital,  
Duston,  
Northampton, NN5 6UN.*

#### AGRANULOCYTOSIS AFTER TREATMENT WITH CLOMIPRAMINE INFUSION

DEAR SIR,

I write to report the occurrence of agranulocytosis in a woman of 37 who had been treated with clomipramine infusion for a moderately severe depressive illness. A complete agranulocytopenia occurred some three weeks after the infusion. In the intervening time she had received increasing doses of the drug starting at 50 mg. and with a maximum of 250 mg. each day. Sternal bone marrow examination showed neither white cell precursors nor red cell precursors. During the next three weeks she came very near to death, as much from a severe infection of *Candida albicans* following massive antibiotic therapy as anything else, but she survived, with a complete return of function of her bone marrow.

The manufacturers of clomipramine inform me that only one other case of agranulocytosis has been reported with this drug since it came into use in 1965. Because its chemical structure is so similar to chlorpromazine, which has a directly toxic effect on bone

marrow, it is suggested that the use of the drug in large doses intravenously may carry a greater risk of bone marrow toxicity than its use by mouth.

ALAN C. GIBSON.

*St. Ann's Hospital,  
Haven Road,  
Canford Cliffs,  
Poole, Dorset, BH13 7LN.*

# BRITISH ACADEMY OF PSYCHOPHARMACOLOGY

DEAR SIR,

Further to the letter from the Steering Committee (*Journal*, May 1974, 124, 508), I write to say that the inaugural meeting was held on 22 April last and the Academy formally constituted.

As a result of the Steering Committee's letter, we received 129 letters supporting the formation of the Academy, and one letter against its formation. The inaugural meeting was attended by 45 interested

persons. Letters of congratulation and support were received from the Presidents of the following Colleges of Neuropsychopharmacology: International (C.I.N.P.), American (A.C.N.P.), German (A.G.N.P.) and Turkish (T.C.N.P.).

Professor Max Hamilton was elected first President of the Academy, and Dr. Alec Coppen, President Elect. Other officers and a council of ten members were also elected. It was decided that one of the main objects of the Academy would be to provide a means of integrating the many disciplines involved in psychopharmacological research, although there would be some emphasis on clinical psychopharmacology. To this end, applications for membership will be considered from interested persons, and any of your readers who make like further details are invited to write to the undersigned.

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*Honorary Secretary.*

*325 Staines Road,  
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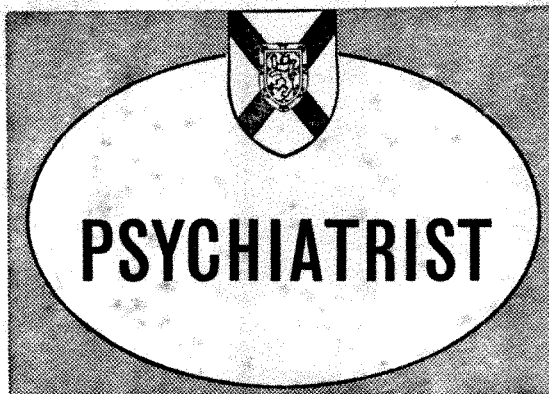
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- 1 *Modern Med.*, 17, 438, 1972
- 2 *Practitioner*, 210, 135, 1973
- 3 *Am.J.Psychiatr.*, 130, 1142, 1973
- 4 *Practitioner*, 198, 80, 1967
- 5 *J.Roy.Coll.Gen.Practit.*, 23, Suppl. 2, 33, 1973
- 6 *Practitioner*, 199, 325, 1967

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<sup>1</sup> *Dis. Nerv. Syst.*, 1972, 33(7), 459

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##### Side-effects

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Tiredness, fatigue and lassitude are common in the first few weeks but become much less so from the third month.

Gynaecomastia. About one patient in five develops transient or

perhaps in some cases permanent enlargement of the mammary glands. In rare cases galactorrhoea and tender benign nodules have been reported.

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Chronic liver disease. Although contra-indicated in acute liver disease, Androcur shows good liver tolerance in general. Nevertheless, liver function tests should be done before and every 4-6 weeks during treatment in patients who have chronic liver disease.

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Chronic alcoholism. Alcohol appears to reduce the effect of Androcur, which is of no value in chronic alcoholics.

Haemoglobin. Hypochromic anaemia has been found rarely during long-term treatment, and blood counts before and at intervals of 4-6 weeks during treatment are advisable.

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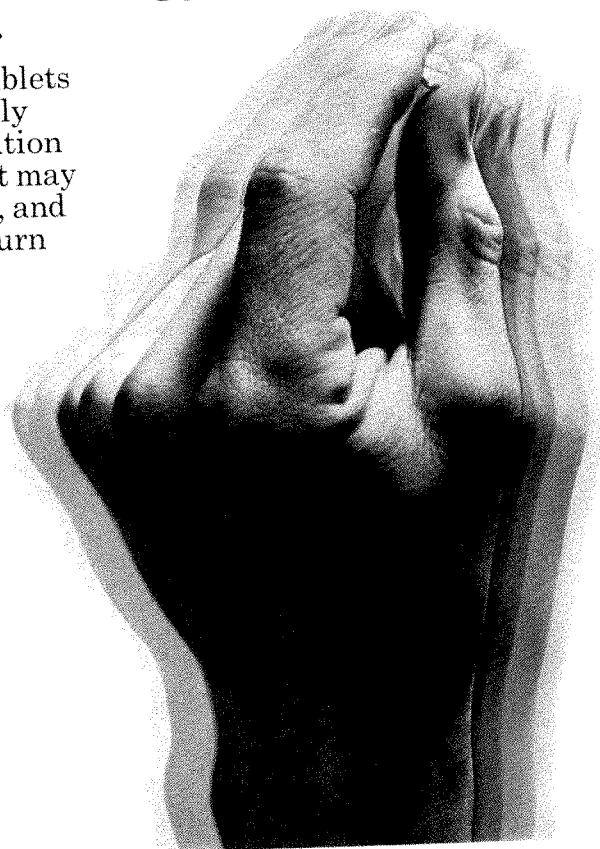
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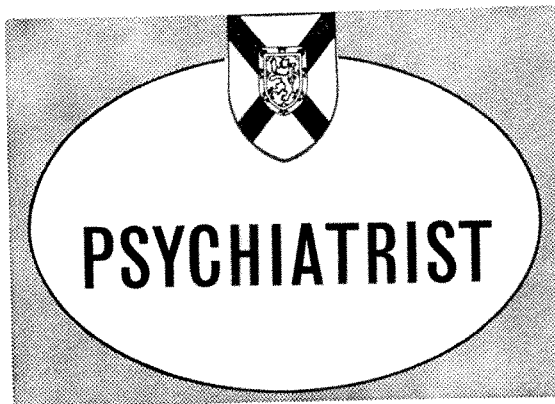
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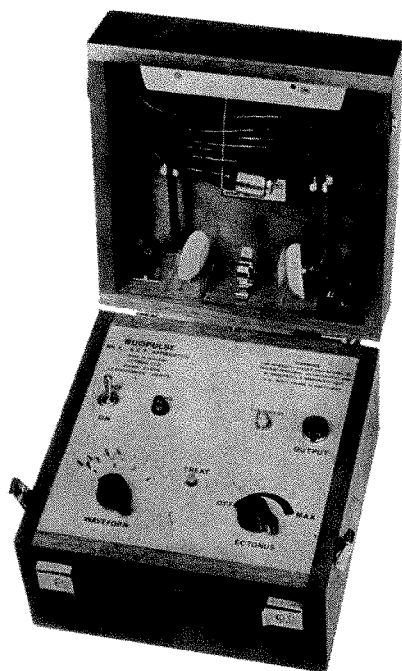
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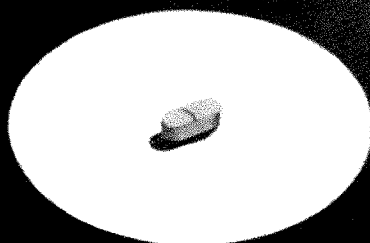
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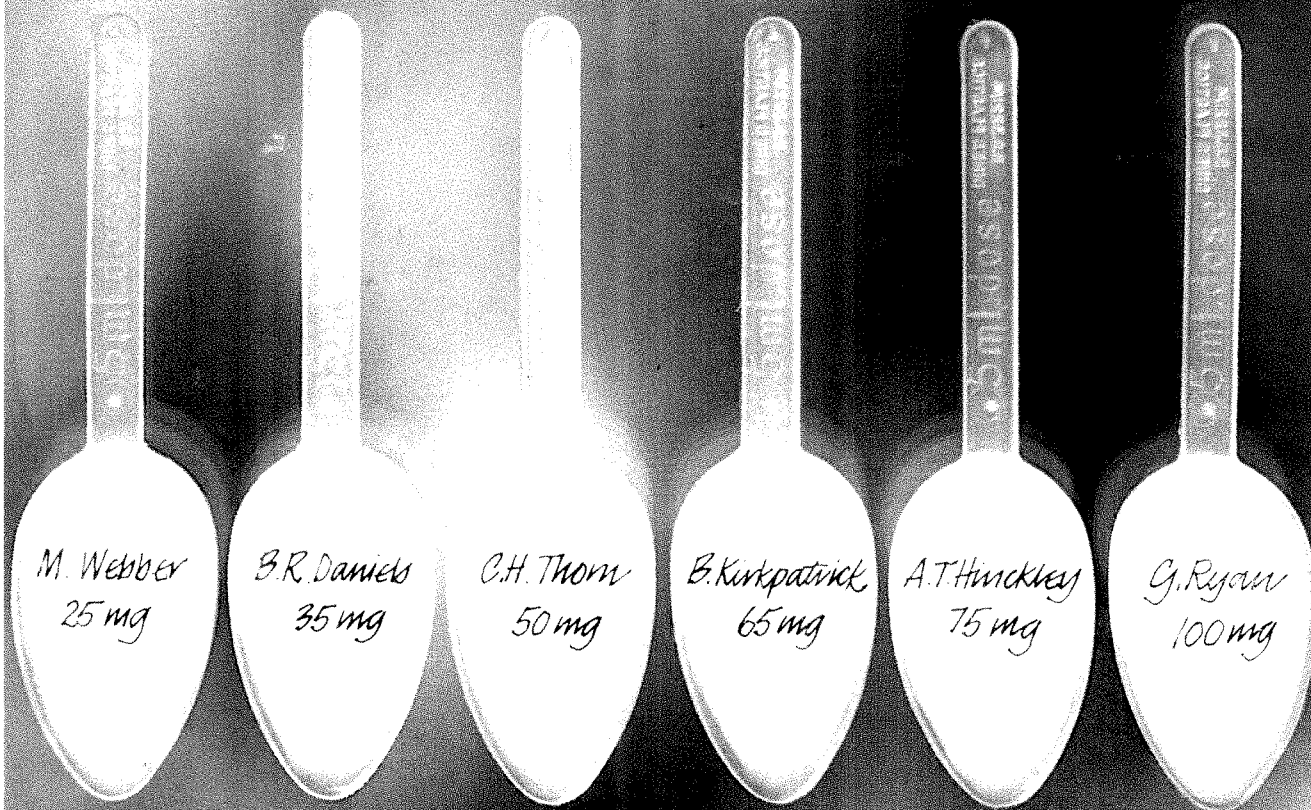
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## Psychiatric Disorder in the Young Adolescents of an Industrial Town

By SHIRLEY A. LESLIE

### INTRODUCTION

The opportunity to conduct a prevalence study of psychiatric disorder among young adolescents arose because a Family and Community Project had been established in Blackburn and the neighbouring town of Accrington. This Project, which is under the direction of Dr. G. Rose, aims to study the causes and possible methods of prevention of delinquency. As part of the survey, the secondary school population had been screened by means of questionnaires given to parents, teachers, and the children themselves, and this provided the starting point for the study described here.

Rutter and Graham estimated that 6.8 per cent of the 10-11-year-old children on the Isle of Wight had a degree of psychiatric disorder sufficiently handicapping to warrant psychiatric attention (Rutter, Tizard and Whitmore, 1970). The question must therefore be asked whether this prevalence rate obtains at other ages and in other areas.

In the National Survey of Health and Development (Douglas *et al.*, 1968) Mulligan investigated the degree of maladjustment among 13-15-year-olds. He concluded that 8.1 per cent children were very maladjusted and 17.6 per cent maladjusted. His criterion for maladjustment was that they had symptoms equal in severity to those of children already attending a Child Guidance Clinic, but he had to rely almost entirely on teachers' assessments; there was no opportunity for individual psychiatric assessment and very little information was obtained from the parents (Mulligan, 1964).

These two surveys, both carried out in the British Isles, have therefore produced rather discrepant results.

The survey of Rutter and Graham (1966) included a more detailed examination of individual children, but it is doubtful whether the Isle of Wight is typical of the country as a whole. Delinquency rates are known to vary and to be particularly high in industrial areas and in certain quarters of large towns (West, 1967). It is therefore possible that there is more psychiatric disorder among the children of these areas, and this would have a most important bearing on the future provision of services.

### METHOD

#### *Brief outline of procedure*

The population eventually selected for study consisted of all children resident in Blackburn and attending local authority secondary schools (excluding the special and direct grant schools) and born between 1 September 1954 and 31 August 1955 (13-14 years old at the time), i.e. 1,198 children.

On the basis of a parental screening questionnaire, a weighted sample of 150 children was selected for psychiatric examination. A psychiatric assessment was made on 141 children, and by comparing the psychiatric diagnoses with the original parental questionnaire scores, hitherto unknown, an estimate of the prevalence of psychiatric disorder in the population was made. Because the initial response to the parental screening questionnaire was only 67.4 per cent, a subsidiary study on a 1 in 5 sample of those who failed to return the questionnaire was also carried out.

#### *Preparation of interview schedules*

Interview schedules were compiled for use with the child and with the parent separately. The parental schedule was identical to that used by the Isle of Wight team in part A (Graham and Rutter, 1968), but because the schedule was to be used by the author alone, no set pattern of interviewing was laid down in the structured part of the schedule, which

consisted of items of behaviour similar to those used for the parental interview in the Isle of Wight study but adapted to this rather older age group. The structured items were rated on three-point scales derived from those used by Wolff (1967 and personal communication), which were adapted from the MacFarlane scales (MacFarlane *et al.*, 1954). The rating was done as the interview proceeded.

Most of the items in the parents' schedule were included in the children's schedule, so that comparisons could be made between the ratings. The child was not, however, directly asked how much he lied, fought or stole, but an estimate of antisocial behaviour was obtained by asking each child what sort of things he normally got into trouble for, what were the worst things he had done and whether this had ever involved police action.

The child's interview was conducted informally, and about fifteen minutes were allowed for him to discuss his attitude to school, his hobbies, interests, friends and family relationships, before the rating of symptoms and items of behaviour was begun.

At the end of both interviews, which were usually conducted consecutively, an overall assessment was made as to the type of psychiatric disorder, the degree of severity and the treatment requirements in an ideal setting. Note was also made of the parents' willingness to accept psychiatric help if it should be needed, whether they had previously sought professional advice for the behaviour or symptoms described, and if so whether it had been helpful. Four grades of severity were used, viz. severe, moderate, mild, and normal. Cases were rated as severe if the disorder was of long standing and included several very abnormal traits; this applied particularly to conduct disorders. A rating of severe was given if there was a definite risk of suicide or if the condition had been psychotic at any time in the past twelve months or was seriously disabling. Cases of moderate severity were those showing sufficient disturbance to be in no way distinguishable from those normally and appropriately referred to a child psychiatrist. Children with mild degrees of disorder and normal children were those not thought to be in need of psychiatric help. The classification system adopted for describing the type of disorder was that suggested by Rutter (1965).

#### *Pilot study*

A small pilot study was carried out so that the interviews with children already referred to a Child Psychiatric Clinic could be compared with interviews given to normal controls. The items on the interview schedules were scored on a three-point scale and the parents' and children's schedules were scored separately, the sum of the two scores being the total

symptom score. No clinic case had a total symptom score of less than 7, and this made a useful basis for comparison with the survey children. The psychiatric diagnosis was, however, a clinical judgement not based on the symptom scores.

#### *Screening questionnaires*

Questionnaires designed to be given to teachers and parents had been compiled by the Family and Community Project team before I joined them. The teachers' questionnaire was similar to that used in the Buckinghamshire study of Shepherd *et al.* (1966) modified by the psychologist on the team, Mr. J. McCallister. Items were rated on a two-point scale. These questionnaires had been circulated to the schools in 1967, but unfortunately two schools had withdrawn their cooperation because some teachers had complained about the personal nature of the questions. In 1968, therefore, these questionnaires were not available from *all* the schools.

The parents' questionnaire had also been adapted from that used in the Buckinghamshire study by the Project team and Dr. J. Ardley, the Medical Officer of Health for Blackburn. It was distributed for the first time in April 1968, and it was decided to use this questionnaire as the primary screening instrument.

#### *Programme*

By July 1968, 67.4 per cent of these questionnaires had been returned, and a sample of 150 children was drawn up for psychiatric investigation. The sample consisted of 105 (70 per cent) children who had a score of 3 or more on the questionnaire, and 45 children (30 per cent) randomly selected. The parental questionnaires were scored very simply, one point being given for each very abnormal behaviour or symptom usually associated with psychiatric disorder.

The actual weighting of the sample and the parental questionnaire scores were not known to me until all the interviews had been completed and the assessments given to an independent person.

The teachers agreed to complete questionnaires on all those who had undergone psychiatric examination, so that these were available for comparison with the parental questionnaires and the psychiatric diagnoses.

The interviewing began in August 1968 and was completed by February 1969. Parent and child attended together and the mother was usually seen first. If the child failed to attend or contact the clinic, the local Health Visitor, who normally knew the family well, visited the home and often managed to gain their cooperation.

*Subsidiary study*

Because the initial response to the parental questionnaire was only 67.4 per cent, a subsidiary study was carried out on a 1 in 5 sample of those who failed to return it. Further parental questionnaires were sent to this sample, enclosing a stamped-addressed envelope for their reply, and the teachers were asked to complete questionnaires on them. I searched through the school medical records of these children, noting particularly if any had been referred to the Child Guidance Clinic, and also looked through the records of the Children's Department and the Probation Office to see how many of them had been before the Court.

## RESULTS

*Main study*

Psychiatric assessments were made on 141 of the 150 children in the sample (94 per cent). The sample actually consisted of 105 children selected as 'possibly maladjusted' with a parental questionnaire score of 3 or more, and 45 children randomly selected. The random sample contained some 'possibly maladjusted' children, so that there were 120 children with a parental questionnaire score of 3 or more (P.Q. 3+) and 30 children with a score of less than 3 (P.Q. <3) described as 'not maladjusted'. Table I shows that there was a highly significant

TABLE I

*Comparison of the severity of psychiatric disorder (as diagnosed by the psychiatrist) with the parental questionnaire scores*

| Severity of psychiatric disorder | Parental questionnaire scores |         | Total |
|----------------------------------|-------------------------------|---------|-------|
|                                  | P.Q. 3+                       | P.Q. <3 |       |
| Severe ..                        | 14                            | 0       | 14    |
| Moderate ..                      | 41                            | 2       | 43    |
| Mild ..                          | 36                            | 6       | 42    |
| Normal ..                        | 23                            | 19      | 42    |
| Total ..                         | 114                           | 27      | 141   |

$$\chi^2 = 28.36; \text{d.f.} = 3; p = < .001$$

correlation between a score of 3 or more on the parental questionnaire and a diagnosis of psychiatric disorder ( $p < .001$ ).

Teachers' questionnaires were received for 143 of the 150 children in the sample, and a

score of 2 or more on this questionnaire was considered to be equivalent to a parental questionnaire score of 3+. (The Project team had estimated that approximately 28 per cent of the children in this age group had a teachers' questionnaire score of 2+ and a similar percentage had a parental questionnaire score of 3+). The teachers' questionnaire scores were also compared with the psychiatric diagnosis, and again there was a significant association ( $p < .01$ ), although the relationship was not so marked as for the parental questionnaire (see Table II). It was found that teachers identified

TABLE II

*Comparison of the severity of psychiatric disorder (as diagnosed by the psychiatrist) with the teachers' questionnaire scores*

| Severity of psychiatric disorder | Teachers' questionnaire scores |         | Total |
|----------------------------------|--------------------------------|---------|-------|
|                                  | T.Q. 2+                        | T.Q. <2 |       |
| Severe ..                        | 12                             | 2       | 14    |
| Moderate ..                      | 27                             | 14      | 41    |
| Mild ..                          | 18                             | 24      | 42    |
| Normal ..                        | 16                             | 23      | 39    |
| Total ..                         | 73                             | 63      | 136   |

(5 questionnaires missing)

$$\chi^2 = 12.68; \text{d.f.} = 3; p = < .01$$

rather more of the conduct disorders than neurotic ( $p < .02$ ).

When the two questionnaires were taken together and compared with the psychiatric diagnosis of severity, no case of severe or moderate disorder occurred among those who had scores of <3 on the parental questionnaire and <2 on the teachers' questionnaire, and this provided some validation of the psychiatric diagnosis itself.

Forty-six per cent of those 'possibly maladjusted' on the parental questionnaire and 52 per cent of those 'possibly maladjusted' on the teachers' questionnaire were eventually thought to have *significant* psychiatric disorder (i.e. severe or moderate). Although the questionnaires selected different children there was a considerable overlap.

*Non-returning sample*

The sample consisted of 80 children: 52 boys, 28 girls, and an analysis of the parents' and teachers' questionnaires is shown in Table III.

TABLE III  
*The distribution of questionnaire ratings in the 1 in 5 sample of non-returners*

| Questionnaire rating   | Boys |      | Girls |      |
|------------------------|------|------|-------|------|
|                        | P.Q. | T.Q. | P.Q.  | T.Q. |
| 'Possibly maladjusted' | 14   | 22   | 5     | 6    |
| 'Not maladjusted' ..   | 8    | 6    | 10    | 16   |
| Not returned ..        | 30   | 24   | 13    | 6    |
| Total .. ..            | 52   | 52   | 28    | 28   |

P.Q. = Parental questionnaire.

T.Q. = Teachers' questionnaire.

The questionnaires were not always obtained on the same children, so that some information was obtained on 69.2 per cent of the boys and 80 per cent of the girls in the sample of 'non-returners'. In addition, 7 boys in the sample had been charged before the Court in the previous eighteen months, and one had been sent to an approved school, i.e. 13.5 per cent compared with 6.7 per cent of juveniles in this age group appearing before the Court in 1968. Two boys had also been referred to the Child Guidance Clinic, i.e. 4 per cent of the boys, much higher than the average referral rate of less than 1 per cent.

Therefore, though the rate of psychiatric disorder among the girls in the 'non-returning' sample was considered to be similar to that of the main group, there was a markedly higher incidence among the boys.

*Prevalence rates*

These were considered separately for each sex.

*Boys*

*Severe disorder.* A completed questionnaire was obtained for 364 of the 624 boys in the age group (58.3 per cent). Fifty-one boys in the sample given to me had parental questionnaire scores of 3+ and 8 had severe disorder (15.7 per cent). There were 93 returned questionnaires with a score of 3+, so that the expected number of boys with severe disorder would be

$$8 \times 93$$

$$\frac{51}{51} = 15 \text{ (calculated to the nearest whole}$$

number). There was evidence, however, of a much higher rate of disorder among the boys in the non-returning sample, i.e. 14 out of the 22 parental questionnaires had scores of 3+ compared with 93 out of 364 in the original returns. This non-returning population numbered 260 boys, so that, assuming this rate held throughout, the number of boys with question-

$$\frac{14 \times 260}{22} = 165. \text{ If}$$

of these 15.7 per cent could be expected to have severe disorder, this would be equivalent to 24 boys. The total number of boys with severe disorder would therefore be  $15 + 24 = 39$  which gives a prevalence rate for severe disorder of 6.2 per cent (see Table IV). Of the 27 children with parental questionnaire scores of less than 3 in the original sample, none had severe disorder, so that it can be reasonably assumed that the screening questionnaire missed a negligible number of those with severe disorder, and no further correction is needed.

*Moderate disorder.* Of the 51 boys in the sample with parental questionnaire scores of 3+, 18 had moderate disorder (35.3 per cent). The expected number of boys with moderate disorder among the 93 with returned parental questionnaire scores of 3+ would therefore be

$$18 \times 93$$

$$\frac{51}{51} = 33. \text{ Assuming that out of the 260 boys}$$

in the non-returning sample 165 would have parental questionnaire scores of 3+; and 35.3 per cent of these might be expected to have moderate degree of disorder, the number of boys so affected would be 58. The total number of boys with moderate disorder would, therefore, be  $33 + 58 = 91$ , which gives a prevalence rate for moderate disorder of 14.6 per cent (Table IV).

It must, however, be noted that out of the 27 parental questionnaires with scores of less than 3, two had moderate disorder, though they were in fact twins rated by one mother. The parental questionnaire could be missing cases of moderate

TABLE IV  
The estimated number of children with psychiatric disorder, with percentage prevalence rates for degree of disorder and sex

| Estimated numbers of children with disorder         | Severe disorder |       | Moderate disorder |       |
|-----------------------------------------------------|-----------------|-------|-------------------|-------|
|                                                     | Boys            | Girls | Boys              | Girls |
| From those with returned parental questionnaires .. | 15              | 11    | 33                | 45    |
| From the 'non-returners'                            | 24              | 4     | 58                | 19    |
| Total .. ..                                         | 39              | 15    | 91                | 64    |
| Expressed as percentage prevalence ..               | %               | %     | %                 | %     |
|                                                     | 6.2             | 2.6   | 14.6              | 11    |

disorder, and therefore this rate of moderate disorder must be considered a minimum estimate.

The minimum total prevalence rate for boys was therefore 20.8 per cent.

#### Girls

*Severe disorder.* A completed questionnaire was obtained for 444 of the 584 girls in the age group (76 per cent). Sixty-three girls in the sample given to me had parental questionnaire scores of 3+ and 6 had severe disorder (9.5 per cent). There were 113 returned questionnaires with a score of 3+ so that the expected number of girls with severe disorder would be  $6 \times 113$

$\frac{63}{113} = 11$ . The results of the non-returning

sample of girls, though necessarily smaller in total number, showed that 5 out of the 15 returned questionnaires had scores of 3+, compared with 113 out of 444 in the original returns. This then was a slightly higher proportion of girls with possibly maladjusted scores in the non-returning sample, i.e. 33.3 per cent compared with 25.5 per cent in the original sample. Because a much larger correction had been necessary in the boys' sample, it was decided to calculate the prevalence rate for girls including this correction, though it is admitted that it may be negligible and based on very small numbers. There were 140 girls in the non-returning group, so that the estimated

number of parental questionnaires with a score of 3+ would be 47. Of these, 9.5 per cent might be assumed to have severe disorder, i.e. 4. The total number of girls with severe disorders would therefore be  $11 + 4 = 15$ , which gives a prevalence rate for severe disorder of 2.6 per cent (see Table IV). There was no correction needed for cases of severe psychiatric disorder missed by the screening questionnaire.

*Moderate disorder.* Of the 63 girls in the sample with parental questionnaire scores of 3+ 25 had moderate disorder (39.7 per cent). The expected number of girls with moderate disorder amongst the 113 with returned parental questionnaires scoring 3+ would therefore be  $25 \times 113$

$\frac{63}{113} = 45$ . Assuming that out of the 140

girls in the 'non-returning' group 47 (i.e. 33.3 per cent) would have parental questionnaire scores of 3+ and 39.7 per cent of these might be expected to have moderate degrees of disorder, 19 girls need to be added, so that the total number of girls with moderate disorder would be  $45 + 19 = 64$ , thus giving a prevalence rate of 11.0 per cent (see Table IV). There were no girls among the 27 children with returned parental questionnaires scores of <3 with either severe or moderate disorder, so that this prevalence rate can be considered reasonably accurate. The total prevalence for girls was therefore 13.6 per cent.

#### Diagnostic categories

Table V shows the distribution of the types of disorder among the 57 children in the sample. Conduct disorder was twice as common as neurotic among the boys. Neurotic disorder was commoner in the girls, though when mixed disorders were included with conduct disorders the numbers were nearly equal.

The neurotic disorders were relatively easy to subdivide into categories resembling adult type neuroses. Conduct disorders were much more difficult to subdivide, but in three boys it was thought that a psychopathic personality was developing as evidenced by pathological lying, inability to learn from experience and a superficial manner. Two girls had a similar personality



TABLE V  
The distribution of psychiatric diagnoses in the sample  
seen by the psychiatrist

| Type of disorder        | Boys | Girls | Total |
|-------------------------|------|-------|-------|
| <i>Neurotic</i> .. ..   | 5    | 16    | 21    |
| Anxiety states ..       | 3    | 8     |       |
| Depressive reaction     | 2    | 6     |       |
| Obsessive-compulsive    | 0    | 3     |       |
| <i>Conduct</i> .. ..    | 11   | 10    | 21    |
| 'Psychopathic' disorder | 3    | 2     |       |
| Antisocial .. ..        | 8    | 8     |       |
| <i>Mixed</i> .. ..      | 6    | 4     | 10    |
| <i>Psychosis</i> .. ..  |      | 1     | 1     |
| <i>Habit</i> .. ..      | 4    | 0     | 4     |
| Enuresis .. ..          | 3    |       |       |
| Encopresis .. ..        | 1    |       |       |
| Total .. ..             | 26   | 31    | 57    |

deviation with more attention-seeking behaviour. The boys deemed antisocial were usually members of delinquent gangs but were said by their parents to have poor peer relationships, though they did not perceive this themselves. The term socialized delinquency was not therefore used. Among the boys with conduct disorder, 5 had been charged before the Courts at least once and another 4 had received formal police cautions. Only one of the girls with conduct disorder had been charged before the Court for theft, but 2 had run away from home for several days, and all were flouting parental authority. At least 3 had had sexual intercourse, and one of them had become pregnant. The girl with a psychotic disorder had had a short-lived episode some months previously following an ear operation, and she had also been charged with theft. It was not possible to make an exact diagnosis. Of the children with mixed disorders 2 (one boy and one girl) had been charged in Court and 2 boys had received formal cautions. One boy had run away from home for two months. It was not possible to generalize this information to the whole population, because of the lack of data on a large proportion of the boys. The girls' sample was probably representative.

#### Parents' perception of disorder

The parents of 37 out of the 57 children (64.9 per cent) thought to have moderate or

severe psychiatric disorder in the survey sample regarded their child's behaviour as abnormal; only 8 (14 per cent) regarded it as normal. There was no relationship between the type of disorder and the parents' perception, although rather more boys than girls were perceived as disturbed by their parents ( $p < .10$ ).

#### Parents' willingness to accept psychiatric help

Of the parents interviewed, 83 (58.8 per cent) said that they would be willing for their child to attend a Child Guidance Clinic if this was thought to be necessary, and there was no significant difference between the parents of children with or without disorder as to their willingness. Nineteen (13.4 per cent) were definitely unwilling, and the rest expressed doubts. The most important finding was that the parents of 12 children were actively requesting psychiatric help, and all but one of these had severe or moderate disorder. These were in addition to the three already receiving treatment.

#### Previous referrals

The parents of 33 children with significant psychiatric disorder had sought advice previously on account of the child's symptoms and behaviour difficulties, and 28 of them had been seen by doctors, i.e. general practitioners, school medical officers, and paediatricians. Of these 6 had been referred to a psychiatrist, but only 4 had been seen. Of the parents of children with only mild disorders which were not thought to need psychiatric help, 22 had also sought similar help in the past, and one of them had seen a psychiatrist. More of the parents of children with psychiatric disorder were dissatisfied with the help given ( $p < .02$ ), but this dissatisfaction was spread throughout all the agencies, including the psychiatrists, and was probably related to the continuing disturbance in the child. The parents of 24 out of the 57 children with psychiatric disorder had not sought advice at any time; some did not perceive abnormality, but others did not know of anyone who would help with such problems.

#### Treatment requirements

The treatment requirements of the 57 children

with psychiatric disorder were assessed, and from this estimates of the treatment requirements for the age group were made.

All children with psychiatric disorder (severe or moderate) would require attendance at a Child Psychiatric Clinic by definition. Of the 57, 48 were thought to be liable to benefit from out-patient treatment, and for 23 of these this should be all that was required. The number of out-patient attendances could not be easily predicted, but in general a minimum of 4 and a maximum of 12 sessions were envisaged. A minimum of 7 and a maximum of 13 children were thought to be suitable for in-patient treatment: 8 boys and 5 girls. Most of these had severe neurotic disorders, with school refusal and/or severe depression with suicidal preoccupations. Two children with severe conduct disorders might also have been suitable for in-patient observation and investigation. One boy with persistent encopresis would also have benefited. All would have been suitable for accommodation in a *hospital* unit, and this would have probably been acceptable to the children themselves. In some cases hospital admission might only have been a preliminary to either special schooling or hostel placement. A short term unit was envisaged with length of stay 4 weeks to 4 months. This would provide time for both physical and psychological investigation and more intensive individual or group therapy than could be given on an out-patient basis. It would also be possible to assess the child away from the background which might have been producing the disturbance and to which help could be given in order to effect a change.

At the minimum level, in-patient accommodation was therefore required for 12 per cent of the children with psychiatric disorder, and in terms of the total population this would be 2.3 per cent of the boys and 1.6 per cent of the girls. Therefore, in any one year, approximately 20 children in this age group would benefit from in-patient treatment, and if the average length of stay was two months this would mean 3 beds. An adolescent unit, therefore, taking a 4-5 year age group would require 15 beds, assuming the rates stayed constant with increasing age. This of course presupposed that all the children with

psychiatric disorder would be referred to a psychiatrist, at present an impossibility.

The study showed that at the time of the survey there were 15 children whose parents were actively requesting psychiatric help, but only 3 were receiving it. This represented 26 cases in this age group, and if this minimum present need was averaged out over 14 years of childhood (4-18) this would represent an urgent case load of 364 children, more than the recommended yearly case load for a full-time Child Psychiatrist (Ministry of Education, 1955).

#### *Validation*

The potential usefulness of this survey depends on the validity of the screening instrument and the psychiatric assessment. The screening technique did not aim to detect *only* those children with psychiatric disorder, but rather to stratify the sample so that it contained large numbers of the 'possibly maladjusted'. Because one of the aims of the survey was to establish the need for services, it was important that the investigator should see a larger number of disturbed children than would have been obtained by random sampling. The greatest inaccuracy arose from the rather low response rate to the parental questionnaire (67.4 per cent), and this was most apparent for the boys (58.4 per cent). The use of teachers' questionnaires as an additional screening instrument (cf. Rutter and Graham, 1966), might have obviated the need for the study of 'non-responders'.

In the Isle of Wight survey, psychiatric disorder was judged to be present when there was an abnormality of behaviour, emotions, or relationships, which was continuing up to the time of assessment and was sufficiently marked or sufficiently prolonged to cause handicap to the child himself and/or distress or disturbance to the family or community. Disorder did not necessarily imply illness in a medical sense. The final assessments were carried out by the authors on the basis of interviews done by others, but there was satisfactory inter-rater agreement, particularly when the ratings were based on the same interviews (Graham and Rutter, 1968; Rutter, Tizard and Whitmore, 1970).

In this study, the criteria for psychiatric disorder were very similar to those used by Rutter and Graham, but the disorder was to have been sufficiently handicapping to require psychiatric intervention at any time in the previous twelve months. The definition is obviously very much dependent upon clinical judgement, as it was in the Isle of Wight study, where both authors worked in conjunction with each other.

Validation of the psychiatric assessment was provided by the following points:

(1) *The ability to distinguish 'normals'*

Thirty children in the original study sample had scored  $<3$  on the parental questionnaire. Only two of these (twins) had any degree of psychiatric disorder (moderate), and both had high scores on the teachers' questionnaires. No case of psychiatric disorder was found in those children who had 'not maladjusted' scores on both parents' and teachers' questionnaires. It is much easier to select disturbed children from a group who are all 'possibly maladjusted' than from a group which contains an *unknown* number of 'normal' children. If psychiatric disorder had been diagnosed on too little evidence, a larger number of those 'not maladjusted' children would have been thought to have psychiatric disorder.

(2) *Comparison with teachers' questionnaires*

The psychiatric diagnosis was itself partly based on the parents' reporting, so that a significant correlation between the parental questionnaire scores and the psychiatric diagnosis might have been expected. The finding, therefore, that the teachers' questionnaire scores, not used in the initial screening, and also unknown at the time to the psychiatrist, *also* showed a significant correlation with the psychiatric diagnosis ( $p < .01$ ) provided further support to the validity of the psychiatric diagnosis.

(3) *Comparison of the interview scores with those of the pilot study*

The psychiatric diagnosis was *not* based on interview scores. Nevertheless, all children with psychiatric disorder in the pilot study had total symptom scores of 7 or more. Diagram A shows that of the 57 children in the survey thought to have significant psychiatric disorder only 5 had scores of  $<7$  (21 mild cases scored 7+). Thus the children with psychiatric disorder in the

survey did not differ from children usually referred to a Child Psychiatric Clinic with regard to the severity of symptoms. The error may have been to *under-rate* mild cases rather than to include too many in the disturbed category.

(4) *Case histories*

These were compiled on each case in order to give other interested workers an insight into the type of case thought to have significant disorder (Leslie, S. A., 1971). Two cases are described briefly:

*Case 1. Mixed disorder: rated severe*

F. was said to be aggravatingly slow about everything he did. He was timid, and was bullied by his peers, but bullied those younger than himself. He was constantly fidgeting, twitching and grimacing. He was easily led into delinquent activities and was about to appear in Court on a charge of breaking into a house and raiding the gas-meter. F. was very tense and anxious at the interview. He felt he had no real friends and was always quarrelling with his siblings. He said without humour that he wished the school would be burnt down, he was always in trouble and couldn't concentrate on his work. When questioned about depression he said he often felt like killing himself, and started to cry.

*Case 2. Neurotic disorder: anxiety state: rated moderate*

E. had wet the bed almost every night of her life. Mother said that in the last two years she had begun to be afraid of the dark and anxious about her health. Lately she had also been inclined to be unusually bad-tempered and irritable. E. asked for treatment for her enuresis. She said she also had frequent headaches. She felt she was still not a very good reader and the teachers were always separating her from her friend for talking and not getting on with her work. Her peer relationships were good, but she revealed many fears and anxieties. At the end of the interview she said she was most worried by her parents' quarrelling and about her mother's health and safety.

## DISCUSSION

The combined prevalence rate of 4.4 per cent with severe disorder and approximately 17.2 per cent with degrees of disorder similar to those already attending Child Psychiatric Clinics is not, therefore, thought to be an over-estimate. It does, however, differ markedly from the rates found in the Isle of Wight, where 2.2 per cent of 10-11-year-olds had severe disorder, and the total prevalence was 6.8 per cent. As the criteria for psychiatric disorder were very similar in the two studies, other factors are probably responsible for the higher rate.

The children were two years older than those

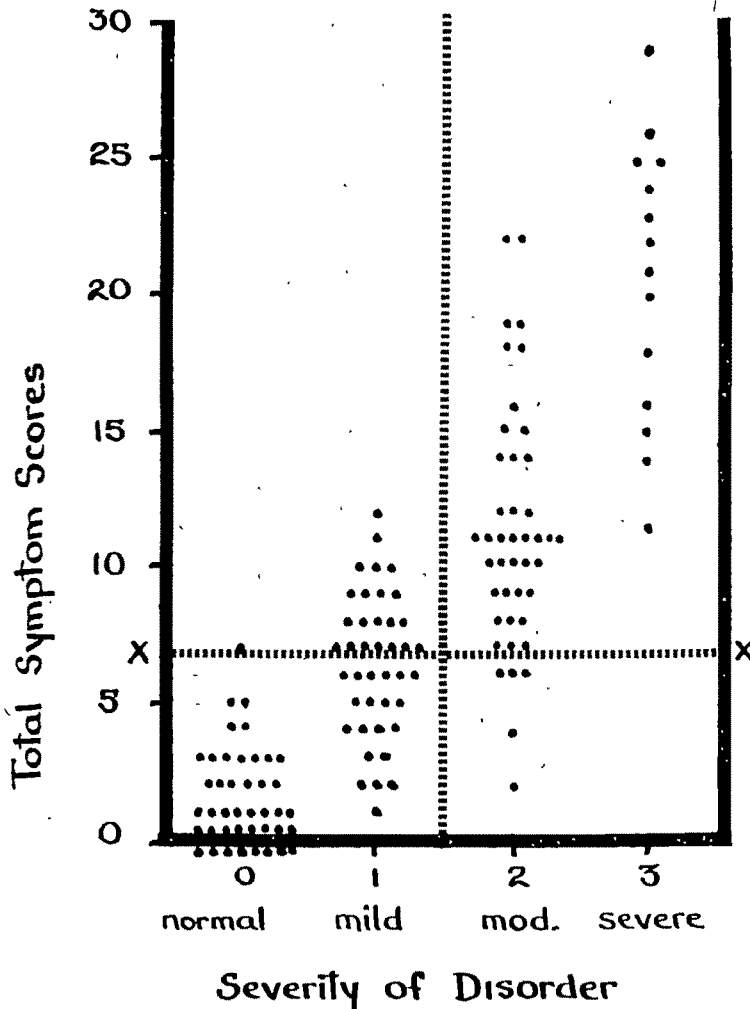


DIAGRAM A

Key for diagram X-X dividing line between clinic cases and controls in pilot study.

Distribution of Total Symptom Scores in relation to the severity of the disorder.

in the Isle of Wight, and although two years' difference in age is unlikely to produce such a marked difference, Baldwin (1968) has noted how the number of girls referred to a psychiatric clinic increases in early adolescence. Other workers have noted how the behaviour disorders exhibited by boys in early childhood give them an increased likelihood of referral in relation to girls (Wolff, 1967; Shepherd *et al.*, 1966).

These results indicated that overall the ratio of girls to boys with psychiatric disorder was approximately 2 : 3 (13.6 per cent : 20.8 per

cent), whereas in the Isle of Wight study the ratio of girls was less than that, i.e. approximately 1 : 2 (44 : 82) (Rutter, Tizard and Whitmore, 1970). This would seem to be in line with Baldwin's findings, but further prevalence studies would need to be done in this age group to confirm this. An interesting finding of this study was the comparatively high rate of conduct disorder among the girls: ratio conduct: neurotic approximately 2 : 3, compared with 1 : 3 in the Isle of Wight study.

There were 44 children in the age group

attending special schools for the physically handicapped or educationally subnormal; one boy was in a residential school for the maladjusted, and 8 boys were in approved schools in 1968. (In addition 130 children of this age attended the direct grant schools.) None were included in the total population of 1,198, and none were in the survey.

Rutter and Graham found that the rate of psychiatric disorder was higher in children with physical disease, particularly neurological disorder. The special schools population, and certainly those in the approved schools, would presumably have a higher rate of disorder than the general population, whereas assuming that the level of intelligence of those children attending the direct grant schools was higher than the average, according to the findings of the Isle of Wight team, a lower rate of psychiatric disorder might have been expected (Rutter, Tizard and Whitmore, 1970). It is doubtful whether the inclusion of these two dissimilar groups would have altered the prevalence rate substantially.

A consideration of the socio-economic backgrounds of the two communities is probably more pertinent to the higher rate of disorder. Blackburn has a population of 106,242, and the Isle of Wight one of 95,752 (Registrar General, 1966 sample census), but Blackburn is, of course, more densely populated, covering 8,089 acres compared with the 94,141 acres of the Isle of Wight. Although there was no significant correlation between the presence of psychiatric disorder in the child and the social class of the parents, the numbers in social class I and II were small, as they constituted only 11.2 per cent of the population, compared with 19.1 per cent on the Isle of Wight. This may well have an effect on the community as a whole.

In 1968, in Blackburn, 100 boys in this age group appeared before the Court charged with offences, compared with 21 boys of the same age on the Isle of Wight (Chief Constable, Hampshire: personal communication). Rutter found that 8 out of 9 boys charged before the Court in his group had psychiatric disorder (Rutter, Tizard and Whitmore, 1970).

With regard to treatment facilities, the Child Guidance services established in the area in 1968 were well below those recommended by

the Underwood Committee (Ministry of Education, 1955), and less than those of the Isle of Wight (see Table VI).

There was no Child Psychiatrist provided by the Regional Hospital Board nearer than Lancaster or Manchester (each 25 miles away). Blackburn was, therefore, not only more deprived in a socio-economic sense, but deprived of child psychiatric services to an extreme degree. The higher rate of psychiatric disorder in this community could have been due to any or all of these factors.

Of the parents of children with psychiatric disorder in the sample, 64.9 per cent recognized that their child was disturbed, and 58.8 per cent indicated their willingness to accept Child Guidance help. Although it might be argued that many of the parents of children in the 'non-returning' sample would be unwilling to accept psychiatric help, many of the children ought to have their needs assessed at a child psychiatric clinic. There is no doubt that when a child psychiatric clinic is established and seen to be helpful others would request help. Only about 1 in 20 of the children with psychiatric disorder were receiving psychiatric treatment at the time of the survey, compared with 1 in 10 in the Isle of Wight. Of the children with disorder 42 per cent had not been receiving help of any sort for their disorder. The parents of 15 of the 57 children with psychiatric disorder (26.3 per cent) were requesting psychiatric help at the

TABLE VI

*Staff of Child Guidance Clinics (Local Authority) on 31 December 1966. (Quoted in Summerfield Report, Department of Education and Science, 1968)*

|                   |    | Full-time equivalents:<br>professional staff |                          |                           |
|-------------------|----|----------------------------------------------|--------------------------|---------------------------|
|                   |    | Psychiatrist                                 | Educational psychologist | Psychiatric social worker |
| Blackburn         |    |                                              |                          |                           |
| School population |    |                                              |                          |                           |
| 16,436            | .. | 0.10                                         | 0.10                     | —                         |
| Isle of Wight     |    |                                              |                          |                           |
| School population |    |                                              |                          |                           |
| 13,405            | .. | 0.36                                         | 1.00                     | 1.05                      |

time of the survey, and this present level of need, at the very minimum, represented more than an average yearly case-load of one full-time child psychiatrist if it was spread evenly through all the years of childhood.

This study did not set out to determine aetiological factors in the development of psychiatric disorder; rather the aim was to establish a prevalence rate for the area, with a view to the planning of services. The design of the survey was such that it was impossible to adjust the findings to a known probable rate derived from previous surveys. It certainly cannot be claimed that adequate psychiatric help in childhood will prevent future mental illness, nor can it be said that psychiatric help alone would solve all the difficulties of these children. Nevertheless, there is no doubt that many of the children seen in this survey, particularly those with severe disorders, were either suffering themselves or causing their families and/or school serious problems. In many cases, the psychiatrist will not be the only nor the most important person to be involved in treatment. Psychologists, social workers, family doctors, educationalists, youth workers, etc., all have roles to play in varying degrees. Further research is also needed into the causes of psychiatric disorder in children, paying attention not only to intrafamilial tensions but also to environmental and social factors.

This study has highlighted the *extent* of the problem. Not only is there an immediate demand for the services of a full-time Child Psychiatrist, but it would be impossible for him to attend to all the children at present showing disorder. Rutter has rightly pointed out that it is unlikely that there will ever be sufficient child psychiatrists to see all those children exhibiting disorders. To some extent children are differentially referred according to their parents' tolerance, mental health, and acceptance of the idea of psychiatric help, as well as the degree of their abnormal behaviour.

Child psychiatry is itself a relatively new specialty, whose techniques and treatments are only now being scientifically evaluated. Nevertheless, it would seem imperative that areas of particular need do not fall behind more favoured areas in the provision of services.

At the time of writing, unfortunately, the

Manchester Regional Hospital Board has not finalized its proposals for the extension of the Child Psychiatric Services, so that although two full-time Educational Psychologists have now been appointed to the area, there is as yet no increase in the child psychiatric sessions.

#### SUMMARY

An epidemiological study into the prevalence of psychiatric disorder among 13-14-year-old children is described. Psychiatric disorder was considered to be present if the child had symptoms or a disturbance of behaviour equal in severity to those normally referred to a Child Psychiatrist, at any time in the previous twelve months.

The population of 1,198 children was screened by means of a parental questionnaire, and the author was given a weighted sample of 150 children for psychiatric examination. In addition to a diagnosis, recommendations for treatment were made for each child on the assumption of unlimited facilities. The assessments were then compared with the parental questionnaire scores, hitherto unknown, and the prevalence rates were calculated. Because only 67.4 per cent of the parental questionnaires were returned, a subsidiary study on a 1 : 5 sample of 'non-returners' was carried out, and this indicated that, particularly among the boys, the prevalence rate was much higher than that of the original sample. After adjustment for the non-returners the rates of severe disorder were 6.2 per cent boys, 2.6 per cent girls and for moderate disorder 14.6 per cent boys and 11 per cent girls.

Validation of the psychiatric diagnosis was provided by comparing it with both parents' and teachers' questionnaire scores, and with the total symptom scores of clinic children in a pilot study.

The study is compared with that among 10-11-year-olds in the Isle of Wight, and the higher rate is thought to be a feature of the area rather than the age of the children and not due to different criteria for diagnosis.

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## Sex Differences in the Aetiology of Antisocial Disorders in Children in Long Term Residential Care

By S. N. WOLKIND

### INTRODUCTION

One of the most important contributions of child psychiatry to the general raising of standards of child care has been the identification of various abnormal life experiences which appear to be harmful to healthy emotional development. Two outstanding contributions, the descriptions of 'institutionalization' (Goldfarb, 1944; Bender and Yarnell, 1941) and 'maternal deprivation' (Bowlby, 1951) have had considerable impact on the organization of children's homes and the setting up of services designed to prevent family breakdown.

The number of children in the care of local authorities in this country, however, remains high (70,000 (H.M.S.O., 1970)), as does the rate of psychiatric disorder seen amongst these children (Yule and Raynes, 1972). It would appear that to make any further headway in the prevention and treatment of these disorders it is necessary to accept that closer attention should be paid to the different factors implied by a concept such as deprivation (Yarrow, 1961) and that it should not be expected that a single event will produce the range of different behavioural patterns seen in children in institutions (Andry, 1962). Rutter (1972) has suggested that a term as open in its meaning as 'maternal deprivation' has now outlived its usefulness and progress will come only from the examination of those factors which modify a particular child's response to a particular abnormal life experience.

Among the various modifying factors which Rutter feels might be of importance in deciding a child's response to, for example, separation or admission to an institution is its sex. Despite the apparent obviousness of this point, there has been little interest in sex differences in response to these circumstances. Descriptive accounts have suggested differences (e.g. Skarlew, 1959) but there is little systematic information.

In children living with their own families it has been shown that quite different factors appear to be related to antisocial disorder in boys and girls (Rutter, 1970). This is a disorder which is particularly prevalent in children who are living in institutional care (Ackhurst, 1972).

This paper examines whether the same or different factors are related to the development of antisocial disorder in boys and girls in a long-stay children's home, and whether in each sex factors related to the disorder in children outside institutions are in operation.

### METHODS

The subjects of the study were all 92 children (39 girls, 53 boys) aged 5 years to 12 years 11 months, who had been resident in a large children's home for at least six months.

Each child was interviewed using standardized interviews (Rutter and Graham, 1968; Graham and Rutter, 1968). Later in the same week the child's houseparents were similarly interviewed. The results of the two interviews were combined and a clinical diagnosis made. If the child was felt to show psychiatric disturbance a diagnosis was made on the lines suggested by Rutter (1965). In addition, a severity rating of mild or severe was made, depending on the degree of handicap caused by the symptoms. After the diagnostic formulation had been completed, information about the child's background, family, and experiences of being in care were collected from the child's case-notes.

### *Description of the home and the children*

The children's home is a 'cottage drive' home run by one of the Inner London Boroughs. The children are in cottages of 15-20 children and the general administration of the establishment would probably be rated as 'child orientated' (King, Raynes and Tizard, 1971).



Except for four attending a tutorial unit, all the children in the sample attended state schools outside the home. The children come from a socially deprived area and from a background of extreme family disorganization. The commonest reasons for admission of the children were: mother unable to cope, desertion by the mother, and neglect or cruelty by the parents. The 92 children were born to 48 mothers and formed part of much larger sibships with a mean of 5.7 children to each mother. Sixty-two of the children had both parents born in the United Kingdom or Eire, 21 had mothers born in the United Kingdom or Eire and the father from Africa, India, Pakistan or the West Indies, 2 of the children had both parents born in Pakistan and 7 had both parents born in the West Indies. All but one of the children were born in the United Kingdom. The experience of residential care varied: 54 of the children had spent over one half of their lives in care; 30 children had had only one admission to care and a further 30 had had four or more separate admissions.

### RESULTS

#### *Psychiatric disturbance in the children*

Table I shows the children's diagnoses by sex. In all, 69 of the children were felt on the basis of the two interviews to be showing a psychiatric disorder. About equal proportions of boys and girls showed psychiatric disturbance. The children showing a 'mixed disorder' had an equal number of antisocial and neurotic symptoms. Rutter has suggested (Rutter *et al.*, 1970) that these children are far more akin to the antisocial than the neurotic group, and in further analyses they have been combined with the antisocial group. The two boys with a diagnosis of 'other' disorder are one with a hyperkinetic disorder and one with a severe 'habit' disorder of encopresis and diurnal enuresis. The combined antisocial/mixed disorder is commoner in boys than in girls, but the difference is not significant ( $\chi^2 = 1.38$ ).

#### *Severity of the disorder*

Table II shows the severity of the disorder in the children with either antisocial or neurotic disorder. Antisocial disorder was clearly rated

TABLE I  
*The children's psychiatric disorders—boys and girls*

| Diagnosis         | Boys |    | Girls |    |
|-------------------|------|----|-------|----|
|                   | n    | %  | n     | %  |
| No abnormality .. | 14   | 25 | 9     | 23 |
| Neurotic ..       | 16   | 30 | 20    | 51 |
| Antisocial ..     | 15   | 28 | 9     | 23 |
| Mixed ..          | 6    | 12 | 1     | 3  |
| Other ..          | 2    | 5  | 0     | 0  |
|                   | 53   |    | 39    |    |

TABLE II  
*Nature of psychiatric disorder and severity rating*

| Severity  | Antisocial disorder | Neurotic disorder |
|-----------|---------------------|-------------------|
| Mild ..   | 6                   | 24                |
| Severe .. | 25*                 | 12                |

\* Antisocial disorder more often severe ( $\chi^2 = 13.25$ , 1 d. of f.,  $p < .01$ ).

far more often as a severe disorder ( $\chi^2 = 13.25$ , 1 d. of f.,  $p < .01$ ), i.e. a condition affecting and handicapping the child in most aspects of its life.

#### *Prolonged early admission to care and antisocial disorder*

Prolonged early admission to care is regarded as a key point in the theories that link 'maternal deprivation' to later psychiatric disorders. In Tables III(a) and (b), the relationship is shown between a period of 6 months or more in care before the age of 2 and antisocial disorder in boys (IIIa) and girls (IIIb). The expected number of antisocial girls with an early admission is too small to allow an accurate  $\chi^2$ , but a comparison between the association for boys and girls can be made by obtaining an estimate of the 'relative risks'.

\* Relative risk

$$\begin{array}{c} \text{Disorder} \\ + - \\ + a \quad c \quad r. r. = \frac{ad}{bc} \quad SE(\log \text{ Rel. risk}) = \\ \text{Factor} \quad - b \quad d \quad (.4343) \sqrt{\frac{1}{a} + \frac{1}{b} + \frac{1}{c} + \frac{1}{d}} \end{array}$$

A relative risk of over 1 suggests a positive association between a preceding factor and a present disorder, a risk of under 1 a negative association.

TABLE III (a and b)  
*Prolonged early admission to care and antisocial disorder, boys and girls*

|                                              | (a) Boys             |                 | (b) Girls            |                 |
|----------------------------------------------|----------------------|-----------------|----------------------|-----------------|
|                                              | Anti-social disorder | Non anti-social | Anti-social disorder | Non anti-social |
| 6 months care before aged 2                  | 5                    | 11              | 5                    | 5               |
| Not admitted or under 6 months before aged 2 | 16                   | 21              | 5                    | 24              |
| n =                                          | 21                   | 32              | 10                   | 29              |

3(a) Boys R.R. = 0.59; 3(b) Girls R.R. = 4.8

TABLE IV (a and b)  
*Contact with mother and antisocial disorder, boys and girls*

|                | (a) Boys |            | (b) Girls |            |
|----------------|----------|------------|-----------|------------|
|                | Contact  | No contact | Contact   | No contact |
| Antisocial     | 11       | 10         | 7         | 3          |
| Non-antisocial | 19       | 13         | 23        | 6          |
| n =            | 30       | 23         | 30        | 9          |

For boys the relative risk is 0.59 (S.E. log. 0.59 = .27) and for girls is 4.8 (S.E. log. 4.8 = .348). This difference in relative risks is significant at  $p < .05$  ( $z = 2.03$ ). The negative risk for boys is not significant but the positive risk for girls is significant at the .05 level.

#### *Family factors and antisocial disorder*

To examine whether factors connected with the parents were of importance in the development of antisocial disorder, contact with each parent in the six months prior to the interview was noted. This relationship is shown in Tables IV and V. There is clearly no relationship between contact with mother and antisocial disorder, but in both boys and girls antisocial disorder is commoner in the children having no contact with their father. The relationship is clearly not statistically significant in girls (Table V(b)  $\chi^2 = 0.69$ ), but a strong associa-

TABLE V (a and b)  
*Contact with father and antisocial disorder, boys and girls*

|                | (a) Boys |            | (b) Girls |            |
|----------------|----------|------------|-----------|------------|
|                | Contact  | No contact | Contact   | No contact |
| Antisocial     | 7        | 14*        | 3         | 7†         |
| Non-antisocial | 21       | 11         | 15        | 14         |
| n =            | 28       | 25         | 18        | 21         |

Table 5(a): \* Significant at .05 level,  $\chi^2 = 4.1$ , 1 d. of f.

Table 5(b): †  $\chi^2 = 0.69$ , 1 d. of f., Not significant.

tion is found with boys (Table V(a)  $\chi^2 = 4.1$ ,  $p < .05$ ).

Consistent associations have been shown between large sibship size and antisocial disorder in children living at home (Rutter *et al.*, 1970). Tables VI(a) and (b) shows the relation between family size and antisocial behaviour for boys and girls. The family size in this group was extreme and the highest third of sibship size, 7 and over was taken as a 'large sibship'. Even in this extreme group the association is found in boys ( $\chi^2 = 6.32$ ,  $p < .02$ ) but not in girls ( $\chi^2 = .03$ ).

#### *Family factors and antisocial behaviour in boys*

Lack of contact with a father and large sibship size both relate to antisocial disorder in boys. Table VII shows the two factors combined. Using a  $\chi^2$  of proportions, the overall  $\chi^2$  is 11.50 on 3 degrees of f ( $p < .01$ ), with contact with father accounting for 43 per cent of

TABLE VI (a and b)  
*Antisocial disorder and sibship size, boys and girls*

| Sibship size   | (a) Boys |            | (b) Girls |            |
|----------------|----------|------------|-----------|------------|
|                | Under 7  | 7 and over | Under 7   | 7 and over |
| Antisocial     | 12       | 9*         | 5         | 5          |
| Non-antisocial | 29       | 3          | 19        | 10         |
| n =            | 41       | 12         | 24        | 15         |

Table 6(a): \* Significant at .02 level,  $\chi^2 = 6.32$ , 1 d. of f.

the value and family size contributing equally in the contact and no contact groups, with 26 per cent of the  $\chi^2$  in the with-contact groups and 30 per cent in the no-contact group. The cells are small, but a marked contrast is seen: only 4 of the 23 boys from smaller sibships and in contact with their father show antisocial disorder, compared with 6 of the 7 from large sibships and having no contact with father.

#### DISCUSSION

Antisocial disorder is common in this group of children, 32 per cent showing either an antisocial or a mixed antisocial/neurotic picture. This is clearly far higher than the figures found in population studies, e.g. 4 per cent on the Isle of Wight (Rutter *et al.*, 1970). It should be noted, however, that an even higher rate has been found amongst boys who had been in the care of a local authority for a period (usually brief) and then returned home (Wolkind and Rutter, 1973).

This latter study demonstrated that the children came from and returned to families which differed from the norm in terms of the high prevalence of broken or disharmonious parental marriages and large sibships. The results from the present study parallel these findings and suggest that for antisocial boys who have experienced *either brief or prolonged* periods 'in care' both the reception into care and the antisocial disorder are secondary to factors in the boy's family. Certainly *early*

admission to an institution, though it does relate to some abnormalities of behaviour (Wolkind, 1973) does not appear to be an aetiological factor in antisocial disorder in boys.

It is difficult to be precise about the exact meaning of the two factors related to the antisocial disorder in boys. Pringle and Bossio (1960) found that continuous contact with an adult from outside the institution was the most important point protecting a child from developing severe emotional disorders. In view of the lack of relationship between antisocial disorder and contact with the mother, this is unlikely to be the mechanism involved here. In many cases of no contact with the father, he had in addition been absent prior to the child's admission to care, and it is likely that both this and the large sibship size are acting as pointers to diffuse family problems, and difficult family relationships. Certainly the association has been shown between absent fathers and consequent family problems and delinquency in boys living in the community (McCord *et al.*, 1962). Similarly the apparent lack of association between deviant family structure and antisocial disorder in girls living in their own homes (Rutter, 1970) is found to hold in this group of girls in institutional care. It is possible that it is not that girls are unaffected by family disturbance, but that the effects are seen at a later age. There is, however, little information on this point.

Antisocial disorder in girls in the community is not as common as in boys (Rutter *et al.*, 1970), and the prevalence in the present group is high. A totally different mechanism appears to be involved with the antisocial girls described here and there appears to be a real link with prolonged *early* experience of residential care. This finding is confirmed by the study of children who had been in care (Wolkind and Rutter, 1973) where the very few girls with antisocial disorder tended also to have had prolonged early experiences of institutional life. At this stage it is possible only to guess at the mechanism; whether the girls have been deprived of an essential experience within a family or have suffered from a particular harmful experience within the institution.

These findings are not just of academic interest. In clinical practice child psychiatrists

TABLE VII

*Boys, antisocial disorder, sibship size and contact with father*

(Total  $\chi^2 = 11.5$ . Between contact 4.95 (43%). Within 'contact' 3.04 (26%). Within 'no contact' 3.50 (30%)

| Sibship size        | Contact with father |            | No contact with father |            |
|---------------------|---------------------|------------|------------------------|------------|
|                     | Under 7             | 7 and over | Under 7                | 7 and over |
| Antisocial disorder | 4                   | 3          | 8                      | 6          |
| Non-antisocial      | 19                  | 2          | 10                     | 1          |
| n =                 | 23                  | 5          | 18                     | 7          |

are frequently called upon to make recommendations about the need to remove a child from its family. In each case the individual circumstances of the child and the residential places open to it are the major determinants, but general guidelines are of obvious importance. The majority of antisocial children in this study were severely handicapped by their behaviour, and the prognosis for this disorder has been shown to be poor (Robbins, 1970). For boys these findings add to the growing body of evidence that remaining in contact with a family with deviant or disturbed relationships may be more damaging than admission to a well run children's home. For girls the converse may be true, but it is evident that attempts must be made to understand more fully the nature of the effects of early residential care.

For research workers in child psychiatry the results point to the need to accept that it is possible that totally different mechanisms are involved in the production of identical clinical pictures in boys and in girls.

#### SUMMARY

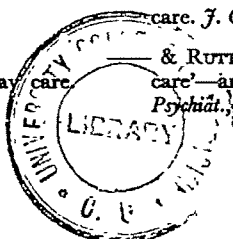
A psychiatric study of 92 children (53 boys, 39 girls) aged 5-12 years, in a long-stay children's home, showed 40 per cent of the boys and 26 per cent of the girls to have an antisocial or mixed antisocial/neurotic disorder. Quite different factors were associated with this disorder in each sex; for boys lack of contact with father and large sibship size, for girls prolonged early experience of residential care. The implications of these findings for child psychiatric practice are discussed.

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## Study Problems in Ugandan Secondary School Students: A Controlled Evaluation

By KLAUS K. MINDE

Recent reviews dealing with psychiatry in sub-Saharan Africa have stressed the overall similarity in the incidence of psychiatric conditions and their diagnostic distribution to those seen in other parts of the world (German, 1972; Giel and Van Luijk, 1969; German and Arya, 1969). All authors emphasize, however, that some clinical pictures seen in Africa, such as those of depression and anxiety states, vary from the manifestations one encounters in European and North American patients.

One particular condition which has been described in both West and East Africa as characteristically African with specific symptoms is the so called 'brain fog syndrome'. First described by Prince (1960) in Nigeria, and confirmed by Mbanefo (1966) and German *et al.* in Uganda (1970), it affects African schoolchildren, who usually complain of a variety of symptoms associated with muscle tension, such as headache and pain in the eyes, chest or abdomen (Prince, 1962). Very similar symptoms have been observed in African undergraduates studying in Britain, whereas graduate students more frequently express stress in the form of general fatigue (Malleon, 1973). Brain fog is said to be very common in Nigeria, and Prince reports 32-64 per cent of schoolchildren to be affected in various schools, but information about the exact incidence, severity and associated background data of youngsters so effected is speculative. Isolation from parents, hierarchical barriers in school between teachers and students, communication in a second language, the great intergenerational discrepancy in life styles, borderline intelligence and faulty study habits have been regarded as important aetiological factors (German *et al.*, 1970). None of these factors, however, has ever been investigated in a matched control sample and no effort has been made to evaluate specific

treatment procedures. The present study attempts to answer some of these questions.

### BACKGROUND OF STUDY

The present author, while working at Makerere University, the only university in Uganda, in September, 1971 began monthly visits to a local 250-bed general hospital, 220 miles north of the capital city Kampala. This hospital had for three years been regularly visited by one of the university psychiatrists in an attempt to treat psychiatric patients within their own district rather than in the only mental hospital of the country which was removed from local community resources and lacked the patient's family support. The local hospital in question had in fact developed a six-bed psychiatric unit, normally run by a psychiatric nurse. The psychiatrist during his monthly visits discussed particular problems with the nursing staff, held a general outpatient clinic and gave lectures about particular psychiatric problems to interested hospital staff and community members.

The author noticed during his visits that up to 25 per cent of the 40-50 patients attending his morning clinic were students from a local secondary school who complained of symptoms usually associated with the brain fog syndrome. The school was a boarding school offering some 680 boys, aged 13-25, complete secondary education. There were 140-150 youngsters per grade in the junior section and about 50 per year in the senior classes. The boys came primarily from the northern districts of Uganda which have only within the last 20 years been in closer contact with modern education, secondary schools having been established mainly after independence in 1962. The school itself was organized very much along British lines, the boys living in particular houses and

being looked after by tutors. Classes were held from 7 a.m. to 2 p.m., followed by lunch, a rest period and study sessions lasting until 10 p.m. There were very few recreational possibilities available to the boys, as broken sports equipment could often not be replaced because of a chronic financial crisis; the library had shrunk to a few volumes, and indoor games had all but disappeared. Despite these difficulties, the school had a generally devoted staff of well-qualified teachers and an excellent medical tutor. He, together with the previous psychiatrist, had given the students suffering from symptoms associated with brain fog high doses of various antidepressant and anxiolytic medication for many months without much symptom relief.

In an attempt to deal with these schoolboys more effectively, the author, in conjunction with the medical tutor of the school, decided to investigate the students so affected more thoroughly and thereafter treat them in groups.

#### SAMPLES

All 15 boys of S1-S4 who had previously regularly attended the psychiatric out-patient clinic for at least six months without any symptom relief were asked to participate in the group. Another ten were selected on a first come, first served basis by the medical assistant at the college. All of them had frequently visited the dispensary for pains in their head or chest and general inability to read or concentrate, and had received various types of drug treatment. All students were eager to participate in the group. Following the selection of patients, the medical assistant chose the alphabetically next boy in the class of each patient as his control, giving a potential sample of 25 problem and 25 control students.

#### PROCEDURE

The author met all problem and control students on separate occasions at the beginning of the first term and asked them to fill in a questionnaire of 46 questions. The questions asked for data of the students' background (age; tribe; family size; language spoken at college and at home; socio-economic status of family; past illnesses; repeated school years; past school

marks; separations in childhood). They furthermore enquired about study difficulties, their causation and previously attempted remedies, study habits (hours of studying per day; before examination; mode of studying) and personal feelings of the student (numbers of friends; closeness to staff; type of recreation).

The questions were discussed with the students and the treatment outlined for the 'problem' group. Treatment consisted of one 90-minute group session each for two groups of 12-13 students once per month, held at the tutor's house on campus. The sessions were also attended by the tutor and the medical assistant. A total of six sessions were held.

Six weeks before the year's final examinations both problem and control students received a follow-up questionnaire with 18 questions enquiring about changes in their condition and an evaluation of the group meetings. Several questions from the initial questionnaire were asked again (study habits, hours of work, cause of condition) to permit comparison with pre-treatment data.

In addition, the author went through each boy's school file recording:

- (1) Marks in all subjects since entry into the school.
- (2) Disciplinary notations or other correspondence indicating psychological or physical difficulties.

#### INITIAL DATA

Tables I and II give the ages and socio-economic status of the two groups, using Hollinghead's (1958) criteria. It will be noted that the size of the control group had decreased to 20 from an optimal 25. This was due to the refusal of two students to fill in the initial questionnaire and to the exclusion of three others because they claimed to suffer from mild to moderate study problems and hence could not function as controls.

Table I shows the problem students to be significantly older than their controls. This may be related to their age at school entrance, as they come from generally poorer families (see Table II) where children often start school at nine or ten years of age only.

It may also be a reflection of past academic

TABLE I  
*Age in years*

|         | Problems | Controls |
|---------|----------|----------|
| N ..    | 25       | 20       |
| Mean .. | 18.24    | 16.6     |
| S.D. .. | 2.45     | 1.63     |

$$= 2.56; \text{d.f.} = 43; p < .02$$

TABLE II  
*S-E class*

|                       | I-II | III | IV & V |
|-----------------------|------|-----|--------|
| Problems<br>N = 24 .. | 1    | 1   | 22     |
| Controls<br>N = 20 .. | 1    | 5   | 14     |

$$\chi^2 = 4.62; \text{d.f.} = 2; p < .01$$

TABLE III  
*Years repeated*

|                       | None | 1  | 2 or more |
|-----------------------|------|----|-----------|
| Problems<br>N = 23 .. | 8    | 13 | 2         |
| Controls<br>N = 20 .. | 15   | 4  | 1         |

$$\chi^2 = 14.39; \text{d.f.} = 2; p < .001$$

TABLE IV  
*Standing in class previous year*

|                       | 1st<br>quartile | 2nd<br>quartile | 3rd<br>quartile | 4th<br>quartile |
|-----------------------|-----------------|-----------------|-----------------|-----------------|
| Problems<br>N = 23 .. | 9               | 5               | 3               | 6               |
| Controls<br>N = 19 .. | 6               | 8               | 3               | 2               |

$$\chi^2 = 3.51; \text{d.f.} = 3; \text{N.S.}$$

success, since there was a significantly higher number of primary and secondary school repeaters among the problem students (see Table III).

The possible conclusion that brain fag students do less well academically than their peers is refuted, however, as Table IV shows no difference in the past year's academic performance between the two groups.

The same results apply when previous school years are compared.

The possibility that the problem students had deteriorated in their work after the onset of symptoms was also investigated by comparing the marks of the year preceding the onset of symptoms with the final results of the 1971 academic year. To our astonishment we could only find six boys whose symptoms began later than Sr. All others had suffered similar complaints far earlier, the average duration of symptoms being 3.25 years. Of the six boys who could be investigated two had deteriorated academically, two had improved and two showed no change since onset of symptoms.

A further indication of the seriousness of the condition in the patient group was the fact that 11 boys claimed to be handicapped every day by their symptoms, 8 several times per week, and only 6 an average of one a week. Twelve boys had seen a number of doctors for more than two years, 9 had been admitted to hospital as well, and 6 had undergone various additional native treatments, all without relief.

The actual symptoms centred around severe headaches and watering eyes (9 boys), together with chest pains and muscle tension (8 boys), dizziness, palpitations (3 boys) and various other combinations (5 boys).

Having established that the brain fag students were not inferior academically, we turned to their past personal lives. Both groups came primarily from farming backgrounds where the polltax rarely exceeded 80 shillings per year. This tax is assessed annually by the local chief and reflects his judgement of the family's cash income from the sale of crops and cattle. The minimum each family has to pay is 60 shillings per year and the maximum is 600 shillings. Salaried employees have the appropriate tax deducted at source. Only two of the brain fag group and three amongst the controls spoke between 25 and 50 per cent English when at home. Four in each group could speak three or more languages, and both groups came from large families having averages of 9.4 and 8.4 living siblings respectively by the same father.

More than 80 per cent of both groups had been living away from home during the first ten years of their life, but in only one boy of each group was this move triggered by psychologically traumatic reasons such as desertion,



death of parents, or misbehaviour of the child. All other children moved into relatives' or friends' homes because they lived closer to school or to help a respective relative. These moves were thus within the cultural context of the tribe and cannot be associated with psychological neglect.

One interesting point emerged, however, in that the problem youngsters reported to have suffered significantly more serious past medical illnesses (see Table V) than their control peers. Serious illnesses were conditions which involved a hospital stay of over one week, any operations, and specifically named diseases with potentially dangerous sequelae such as meningitis, fever resulting in convulsions, and clinical tuber-

TABLE V  
*Past medical history*

|                       | None | One serious illnesses | Several serious illnesses |
|-----------------------|------|-----------------------|---------------------------|
| Problems<br>N = 24 .. | 13   | 9                     | 2                         |
| Controls<br>N = 20 .. | 17   | 3                     | 0                         |

$$\chi^2 = 7.51; \text{d.f.} = 2; p < .05$$

TABLE VI  
*Way of studying*

|                       | Reading only | Reading and oral | Others |
|-----------------------|--------------|------------------|--------|
| Problems<br>N = 25 .. | 15           | 7                | 3      |
| Controls<br>N = 20 .. | 9            | 11               | 0      |

$$\chi^2 = 6.68; \text{d.f.} = 2; p < .05$$

TABLE VII  
*Way of relaxation*

|                    | Physical activities | No relaxation needed | Lying down | Others |
|--------------------|---------------------|----------------------|------------|--------|
| Problems<br>N=25.. | 10                  | 3                    | 9          | 3      |
| Controls<br>N=19.. | 10                  | 5                    | 2          | 2      |

$$\chi^2 = 5.15; \text{d.f.} = 3; p < .1$$

TABLE VIII  
*Professional goal in life*

|                    | Teacher | Doctor | Vet or agri-culture | Others | Don't know |
|--------------------|---------|--------|---------------------|--------|------------|
| Problems<br>N = 25 | 4       | 9      | 3                   | 2      | 7          |
| Controls<br>N = 20 | 3       | 4      | 4                   | 4      | 5          |

$$\chi^2 = 2.75; \text{d.f.} = 4; \text{N.S.}$$

TABLE IX  
*Parental reaction to failure*

|                    | Compassion | Angry | Sad | No fears | Others |
|--------------------|------------|-------|-----|----------|--------|
| Problems<br>N = 25 | 6          | 8     | 4   | 2        | 5      |
| Controls<br>N = 19 | 9          | 2     | 0   | 3        | 5      |

$$\chi^2 = 13.33; \text{d.f.} = 4; p < .01$$

culosis. Admissions to hospital for complaints associated with the present difficulties were not counted as past medical illnesses.

A number of educators have speculated that study habits, isolation in college and excessive hours of work are responsible for many symptoms associated with study problems. Our investigation revealed that a significantly higher number of problem students studied by reading only, while the control students used primarily discussions and oral recitations together with reading (see Table VI).

The two groups did not differ, however, in the amount of time they studied per day (3.1 vs. 3.5 hours per day), but the problem students worked an additional 2.9 hours per day before examination time whereas the controls added only 1.4 hours ( $t = 2.07, p < .01$ ).

The brain fag students also chose different ways of relaxation, 35 per cent choosing to lie down rather than participate in physical activities (see Table VII).

Both groups acknowledged having many good friends, more than half the boys of either group claiming more than ten and none being lonely and friendless. Furthermore, all but three of the problem students stated that they

could go and talk to a particular member of the staff easily and freely. Both groups had nearly identical professional goals in life (see Table VIII), but they varied significantly in their assessment of their parents' reaction to their failing an important examination such as the Cambridge Leaving Certificate (see Table IX).

The groups also differed in the assessment of the incidence of study problems in their classmates. Of the troubled group 50 per cent thought that more than five and 20 per cent that more than ten additional boys in their class suffered similar complaints. The comparative figures among the control group was 20 per cent and 15 per cent respectively ( $\chi^2 = 11.0$ ,  $p < .05$ ).

#### TREATMENT

Following the initial evaluation the author began to treat all affected boys in two groups. Therapy in the groups was aimed at a discussion of each boy's problem and an explanation of his symptoms in simple terms, such as the consequence of muscle tension. The students invariably asked a great number of questions dealing with the whole physiology of their bodies and basic issues of development. They also discussed their work habits, and the policies of the school and wanted to learn how to relax. This latter demand led the author to introduce formal relaxation exercises, beginning with muscle groups of the extremities followed by the abdominal and finally the head muscles. This together with discussion of different study habits made up the content of most of the later sessions.

The main difficulty in the groups centred around some boys' irritation about the author's refusal to give them drugs. These students found it extremely difficult to conceptualize their symptoms as general signs of tension and anxiety, but felt that they had a very particular illness which required very specific medical attention.

The author did not encourage the discussion of intrapsychic problems, as the majority of the students felt such a discussion would be embarrassing and not to the point. Study problems for them were definitely not related to deep psychological conflicts. The presence of

a teacher and the medical assistant was also felt to be a contra-indication for such therapy.

#### FOLLOW-UP DATA

The follow-up questionnaire was answered by 19 students. Six students did not return the forms within three and a half weeks, following which the school was prematurely closed, as all available chairs and tables had to be used for those students writing examination papers, in S.IV and S.VI. There being a general shortage of equipment, all other classes had to go home.

The average number of attended sessions was 4.8, and all but one student felt satisfied with the material covered in the meetings. On a seven-point scale measuring improvement, one boy felt he had improved very much, five considerably, six a little. Five saw no change and two had become a bit worse. Seven students saw the most striking improvement in their general mood, all talking about feeling happier, being able to look ahead or feel near to success in their exams. Five talked about a relief of all their symptoms to varying degrees, but seven had not seen any changes in their symptoms. Five of these had developed new symptoms. The same was stated by two other boys who otherwise claimed to be generally improved. Hours of study per day had not changed (3.37 vs. 3.55), but the extra study hours before examination time had decreased significantly (2.92 vs. 1.86;  $p < .05$ ). The final question which read 'Would you want to get more medication for further study problems?' produced an overwhelming 'yes', despite the many hours of discussion directed against a purely pharmacological approach to study problems.

#### DISCUSSION

The study presented raises a number of questions both methodological and clinical. The sample of 25 problem students is small and may not be representative of the school, as only those boys seeking out help were included in the groups. Treatment was not administered on a double-blind basis with independent observers such as teachers or tutors assessing the students before and after, as none of them was able to spend the necessary time on this task.

The treatment group was nevertheless considered homogeneous, as all students had received generous doses of anxiolytic or antidepressant drugs for at least six months without any gross benefit. The group discussions were seen as a new treatment such as is used in a cross-over design of multiple drugs studies, evaluations using the students as their own controls. This procedure allows us to generalize our results at least to students who have study problems which cannot be relieved by medication. The exact proportion of this group amongst the total population of brain fog students is uncertain. A review of 20 charts of Makerere University undergraduate students suffering from the same condition revealed 13 students still coming for regular medication nine months after their initial clinical contact. As their clinical notes mentioned only minimal symptom relief, and medication had been changed frequently, these patients may well have qualified for the discussion group, giving a drug only success rate of 35 per cent.

From a clinical point of view some of the background data demonstrate interesting differences among the groups. The problem group of students came from somewhat poorer homes where the educational jump from father to son was very wide. They appear to have started school later and been generally more anxious about being a success than their untreated peers, although their academic achievements did not warrant this concern. They furthermore saw their parents as less tolerant to any failure on their part and 65 per cent claimed to have other family members suffering from similar study problems.

The symptoms themselves had been with the group for many years, frequently beginning as early as P.VI or P.VII. They had tried a great variety of treatments, and some letters the author received and several personal interviews showed some boys to be virtually paralyzed by their affliction. Some lay in bed unable to do any work 'just waiting for the exam to come', some ran away from school periodically, sleeping in the bush, some others had spent previous semesters at home and not sat any examination. Yet the problem boys claimed to have as many or more friends than their controls and could

talk to teachers easily, thus showing none of the symptoms associated with social isolation.

On the other hand, the problem students claimed to have experienced more previous medical illnesses than their peers. These illnesses could possibly have conditioned them to experience any kind of discomfort in a somatic form rather than as anxiety. Bennett (1969), in his work at the Makerere University Health Service, comments on how students from tribes which use ritual skin scratchings and burnings as main therapeutic agents against various diseases were significantly more prone to complain about functional disorders than those from tribes practising a different type of native medicine. The higher incidence of affected siblings in the brain fog group may possibly support this hypothesis.

Both groups of our sample aimed to join the high prestige professions of Africa such as doctors, and nobody showed any interest for technical vocations. They also preferred to speak English with their friends, though the majority came from one big local tribe, so demonstrating their desire to join the modern Western world.

Their study habits, however, showed marked differences. While the control students used predominantly the oral and visual modalities of learning, the brain fog group studied mainly by reading only. This group also increased the number of study hours per day before examinations more than the controls did. Both these results can be seen as signs of general anxiety and possibly the result of faulty study habits, as it has been demonstrated that retention is higher if material is presented in more than one modality (Hilgard, 1962).

The result of the discussions are difficult to evaluate. The majority of students saw themselves as better, and had in fact modified some of their study habits. Yet all of them still thought of medication as a good way of treating such a condition in other students, and hence had not abandoned the purely medical concept of their problem. This occurred despite the consistent attempt of the author to demonstrate how general tension and anxiety can create physical symptoms and how systematic muscle relaxation may relieve them. It is possible that more hours of discussion are required to change

such beliefs, and it is furthermore likely that a number of students with similar problems are helped by medication alone. The consistent reporting of feeling happier, having lost a heavy load, being able to plan ahead now, may indicate that in at least some students the symptoms marked a depressive element.

In summary the study indicates that the brain fog syndrome, besides its rather uniform symptomatology, may occur more frequently in certain types of students. Its treatment, as is demonstrated, must extend beyond the purely pharmacological and include systematic psychotherapeutic measures. These should be developed in conjunction with the school staff and medical assistants and do not require highly skilled medical personnel, as our study gives no indication that these students show any other gross neurotic or psychopathic symptomatology.

The model developed at Makerere University, together with the national training institution for secondary school teachers, is a week-end meeting between doctors interested in brain fog symptoms and all local secondary school teachers of a particular area. Both groups have intensive discussions about specific school stresses in the area and are taught basic principles of relaxation. One particular teacher in a school can then be selected to form groups of 10-12 students, and with the support of the school's medical assistant and the back up service of a physician will, it is hoped, be able to decrease significantly the dropout of potentially good students and the immense suffering the condition presently creates in the secondary schools of Africa.

#### SUMMARY

The study examines the background of 25 Ugandan secondary school students presenting

with moderate to serious symptoms of brain fog to a psychiatric clinic, and compares it with 20 matched control students. It furthermore evaluates the efficacy of group treatment for the problem group.

The results show the problem students to vary from their control peers on a number of background variables. Systemic relaxation of muscle groups improved 70 per cent of the brain fog students, while high doses of anti-depressant and anxiolytic medication had failed to do so.

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## Platelet Serotonin of Hyperactive School Age Boys

By J. RAPOPORT, P. QUINN, N. SCRIBANU and D. L. MURPHY

It has repeatedly been demonstrated that hyperactive children improve in behaviour and school functioning when treated with amphetamine, methylphenidate and, according to recent studies, imipramine (Conners, 1972). While these drugs affect catecholamine and indoleamine metabolism, there have been few studies intercorrelating the clinical and biochemical effects of these agents. A small number of untreated hyperactive children have been found to have normal urinary catecholamine and indoleamine excretion (Rapoport *et al.*, 1970; Wender, 1971) although whole blood hydroxyindole concentrations have been reported as reduced (Coleman, 1971). In the present study, platelet serotonin content was examined before and during treatment with methylphenidate and imipramine of a group of boys with the hyperactivity syndrome.

### METHODS

As part of a larger clinical study of the efficacy of methylphenidate and imipramine in hyperactive children, blood samples were obtained from 35 boys who had been referred to a University paediatric clinic because of restless, impulsive and distractible behaviour of sufficient severity to require medical attention. All the boys were between ages 6 and 12 (mean 8.9 years), had a WISC full scale IQ of 80 or above (mean 98), and had no known neurological disorder. Most of them were from middle class, white, suburban families with a mean family income of \$18,000. For inclusion in the study their symptoms had to have been continuously present for two or more years, and not to have been previously treated with drugs.

After initial screening, the patients were randomly assigned to a double-blind treatment trial with either methylphenidate or imipramine

used in average doses of 20 and 80 mg./day, respectively. Blood samples and teachers' behavioural ratings, using a standardized scale (Conners, 1969), were obtained before treatment and, in some patients, after six weeks of drug administration. Blood samples were also obtained from 19 normal healthy boys matched approximately for age with the patient group. Platelets were isolated from heparinized blood by slow centrifugation (Murphy, 1969), and the serotonin content was determined by a ninhydrin fluorometric assay (Snyder *et al.*, 1965) and expressed per mg. of platelet protein (Lowry *et al.*, 1951).

### RESULTS

Platelet serotonin content was found to be similar in both the group of 35 patients with hyperactivity ( $114 \pm 103$  ng./mg. protein) and the 19 normal controls ( $102 \pm 64$ ) (Fig. 1). Eight patients with a family history of hyperactivity did not have values differing from either group ( $104 \pm 54$ ). There was no significant correlation between platelet serotonin content

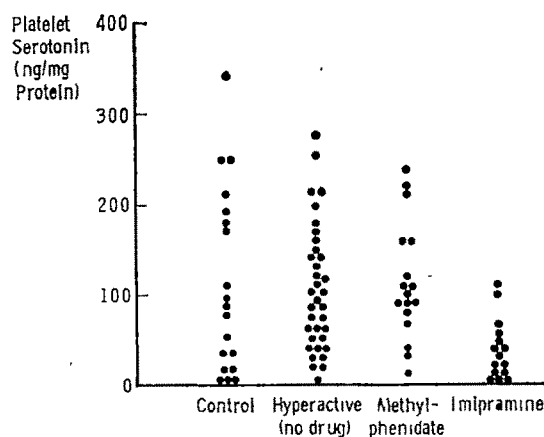


FIG. 1.—Platelet serotonin and treatment condition; paired and unpaired values.

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and the severity of hyperactivity as measured by Factor IV of the teacher rating scale ( $r = .34$ ,  $p = \text{N.S.}$ ).

Imipramine treatment was associated with a reduction of platelet serotonin content to less than 40 per cent of the control values (paired  $t = 5.75$ ,  $p < .001$ ), while methylphenidate treatment was not associated with any significant change in serotonin content (Figs. 2 and 3). The magnitude of platelet serotonin content change with imipramine did not correlate significantly with rated change in behaviour ( $r = -.39$ ,  $p = \text{N.S.}$ ).

#### DISCUSSION

Although platelet serotonin content is thought to constitute most of measured whole blood

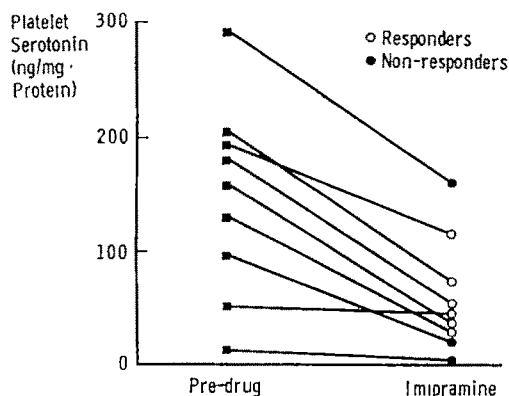


FIG. 2.—Platelet serotonin before and during imipramine; paired values.

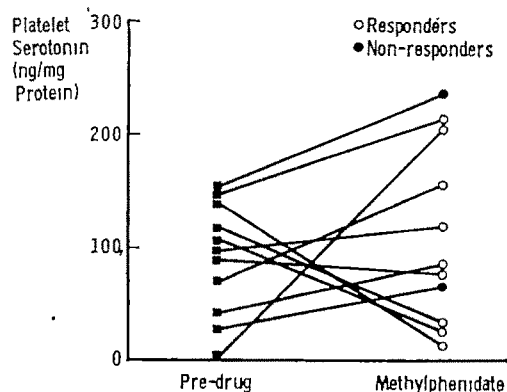


FIG. 3.—Platelet serotonin before and during methylphenidate; paired values.

hydroxyindole concentration, the present study did not verify an earlier report of reduced blood hydroxyindoles in children with hyperactivity. As some hyperactive children with low platelet serotonin content (Wender, 1969) were subsequently found to have normal serotonin levels when tested after one year of treatment with methylphenidate combined with a high tryptophan diet (Wender and Murphy, unpublished), it is possible that dietary differences or other non-specific factors are variably associated with reduced platelet serotonin in some children with the hyperactivity syndrome.

As has previously been reported in adults treated with imipramine (Marshall *et al.*, 1960), platelet serotonin content was markedly reduced after six weeks of imipramine administration, presumably via its inhibitory effects on serotonin transport into these cells (Murphy *et al.*, 1970). As there was no correlation of serotonin content change with clinical effect during imipramine treatment, and as methylphenidate had no similar effects on platelet serotonin content and yet yielded equal or slightly greater therapeutic results in these children (Rapoport *et al.*, 1974), it seems unlikely that this biochemical effect on amine transport and amine storage is closely related to the mechanism of actions of these drugs on the behaviour of children with the hyperactivity syndrome.

#### SUMMARY

Platelet serotonin content did not differ between a group of 39 hyperactive boys and 19 age-matched normal controls. Imipramine treatment markedly reduced platelet serotonin, while methylphenidate had no similar effects. As both drugs were clinically effective, it seems unlikely that change in serotonin transport or storage is closely related to the mechanism of actions of these drugs on hyperactive behaviour.

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## The Pattern of Hostility in Affective Illness

By IVY M. BLACKBURN

Many theoretical accounts of the affective disorders, in particular those by writers of the psychodynamic schools, have emphasized the central role of hostility and aggression. However, there have been very few objective studies of the expression of aggression in patients with affective disorders. Of these, two have used the Hostility and Direction of Hostility Questionnaire (HDHQ) of Foulds (Foulds *et al.*, 1960; Foulds, 1965). Mayo (1967) tested 24 depressed patients before and after treatment and found a significant decrease after recovery, both in their level of general punitiveness and in their level of intropunitiveness. The psychotically depressed patients scored significantly higher than the neurotic depressives. Philip (1971) tested depressed women, and found that extra-punitiveness did not change over time, but that improved patients were less intropunitive than those who showed no improvement. No studies have reported the hostility pattern of manic patients.

These studies were concerned with 'psychotic' and 'neurotic' depression, but recent work (Perris, 1966; Winokur, Clayton and Reich, 1969; Blackburn, 1972) has suggested that an important distinction may be that between 'bipolar' and 'unipolar' depression, i.e. between those patients who over a period have had episodes both of depression and mania, and those who have experienced only recurrent depressions. One aim of the present investigation was to discover whether patients with 'unipolar' and 'bipolar' depression, and those with mania, differ in their aggressiveness as measured by the HDHQ. A second aim was to provide further evidence of the changing pattern of hostility in affective illness after recovery.

### METHOD

#### *Patients tested*

Six groups of patients were tested, of which three showed active symptoms at the time of testing and

three had recovered from a recent illness. The groups were:

*Bipolar (manic-depressive) actively manic* (Bp.M.), i.e. patients who had previously had at least one manic or hypomanic episode and one previous depressive episode, both severe enough to be treated, and who were, in the opinion of the relevant consultant psychiatrist and senior registrar, showing active manic or hypomanic symptoms at the time of testing.

*Bipolar (manic-depressive) recovered manic* (R.Bp.M.), i.e. patients who had previously had at least one manic or hypomanic and one depressive episode requiring treatment, whose most recent episode of illness had been one of mania or hypomania, but who, in the opinion of the consultant and senior registrar, were showing no active symptoms at the time of testing.

*Bipolar (manic-depressive) actively depressed* (Bp.D.), i.e. patients who had previously had at least one manic or hypomanic episode and one depressive episode, both severe enough to be treated, and who were, in the opinion of the consultant psychiatrist and senior registrar, showing active depressive symptoms at the time of testing.

*Bipolar (manic-depressive) recovered depressive* (R.Bp.D.), i.e. patients who had previously had at least one manic or hypomanic and one depressive episode requiring treatment, whose most recent episode of illness had been one of depression, but who, in the opinion of the consultant psychiatrist and senior registrar, were showing no active symptoms at the time of testing.

*Unipolar (recurrent depressive) actively depressed* (Up.D.), i.e. patients who had previously had at least three episodes of depression without mania, severe enough to be treated, and who were, in the opinion of the consultant and senior registrar, showing active symptoms of depression at the time of testing. Perris (1966) observed that patients with at least three past episodes of depression without mania were unlikely to develop mania in the future.

*Unipolar (recurrent depressive) recovered depressive* (R.Up.D.), i.e. patients who had previously had at least three episodes of depression without mania, severe enough to be treated, and who were, in the

opinion of the consultant and senior registrar, showing no active symptoms at the time of testing.

Only patients aged 60 and under, who had an unequivocal diagnosis were included, and special care was taken to avoid cases of organic psychosis and of schizophrenia. On the whole, however, the rigorous criterion of three clear-cut treated episodes of affective illness in the history tended to exclude doubtful cases. Eighteen patients were included in each group, except for the bipolar depressed (Bp.D.), group, in which there were 16 patients.

The sex, age and intelligence (Cattell's B factor of the 16 PF) are shown in Table I. The two manic groups did not differ in age, but were significantly younger than the four depressive groups which did not differ among themselves.

#### *Hostility and Direction of Hostility Questionnaire*

In addition to the works reported above, the HDHQ has been used in studies of attempted suicide (Vinoda, 1964; Philip, 1968) and of prisoners (Foulds, 1968), and to differentiate between patients with 'psychic' and 'somatic' symptoms (Foulds, 1966).

An assumption underlying the questionnaire is that hostility can be directed either towards the self or outwards towards others and objects. Caine *et al.* (1967) used two main measures made up of the five sub-scales of the questionnaire, Self-Criticism (SC), Delusional Guilt (DG), Acting-out Hostility (AH), Criticism of Others (CO) and Projected Hostility (PH). General Hostility consists of the total score obtained from all the scales, and Direction of Hostility

is obtained by the formula  $(2SC + DG) - (AH + CO + PH)$ , positive scores indicating intropunitiveness.

The present study followed Philip's suggestion (1968, 1971) of an alternative scoring system. Foulds *et al.* (1960) had concluded: 'within-group correlations between scales were all positive, but when the size and pattern of the correlations were considered, it was clear that the extrapunitiveness scores were to some extent measuring something different from the intropunitiveness scores'. Several later studies (e.g. Mayo, 1967; Philip, 1971) suggested that the intropunitive measures vary over time more than the extrapunitive measures. Philip proposed that extrapunitiveness and intropunitiveness should be measured independently and not combined in a Direction of Hostility score.

In the present study, therefore, only the following two measures were used:

$$\begin{aligned}\text{Extrapunitiveness (Sum E)} &= AH + CO + PH \\ \text{Intropunitiveness (Sum I)} &= SC + DG\end{aligned}$$

Since General Hostility (E+I) is a simple summation of these two components it was not included as a separate measure. Sten scores (standard 10 point scale) were used throughout, scores of 5 and 6 being average, 4 and 7 slightly deviant, 2, 3, 8 and 9 being markedly deviant; stens of 1 and 10 indicate scores which deviate by more than 2 S-D's from the mean. The sten scores referred to in this study were based on the general population norms of 154 males and 372 females, with separate normative data for the sexes, obtained by Philip (personal communication).

TABLE I  
*Sex, age and intelligence of the six groups of patients*

|                     |       |    | Bp.M. | Bp.D.      | Up.D. | R.Bp.M. | R.Bp.D. | R.Up.D. |
|---------------------|-------|----|-------|------------|-------|---------|---------|---------|
| N                   | ..    | .. | 18    | 16         | 18    | 18      | 18      | 18      |
| Male/female         | ..    | .. | 11/7  | 7/9        | 7/11  | 11/7    | 8/10    | 7/11    |
| Age:                | Mean  | .. | 37.1  | 50.6       | 48.6  | 39.1    | 48.1    | 47.1    |
|                     | Range | .. | 19-58 | 40-60      | 22-59 | 23-60   | 38-60   | 31-58   |
|                     | S.D.  | .. | 12.7  | 6.5        | 8.2   | 10.6    | 6.2     | 7.2     |
| B Factor score:     | Mean  |    | 7.05  | 6.43       | 6.83  | 6.83    | 7.11    | 7.61    |
|                     | S.D.  |    | 1.8   | 3.3        | 1.8   | 1.4     | 2.2     | 1.2     |
| F. for age          | ..    | .. | 5.92  | $p < 0.01$ |       |         |         |         |
| F. for intelligence | ..    | .. | 1.53  |            |       |         |         |         |

## RESULTS

The scores of the six groups on the intro-punitiveness and extrapunitiveness scales of the HDHQ are shown in Table II.

TABLE II

*Raw scores (in brackets) and sten scores of six groups on intro-punitiveness and extrapunitiveness*

|               | N  | Intro-punitiveness |                | Extra-punitiveness |                |
|---------------|----|--------------------|----------------|--------------------|----------------|
|               |    | Mean               | S.D.           | Mean               | S.D.           |
| 1. Bp.M. ..   | 18 | (8.00)<br>6.33     | (3.53)<br>2.11 | (14.50)<br>7.67    | (5.08)<br>1.57 |
| 2. Bp.D. ..   | 16 | (10.06)<br>7.94    | (3.27)<br>2.05 | (7.50)<br>4.89     | (4.68)<br>1.84 |
| 3. Up.D. ..   | 18 | (11.78)<br>8.22    | (2.02)<br>1.25 | (9.67)<br>6.00     | (3.07)<br>1.19 |
| 4. R.Bp.M. .. | 18 | (7.72)<br>6.00     | (4.75)<br>2.91 | (7.44)<br>4.89     | (5.79)<br>1.78 |
| 5. R.Bp.D. .. | 18 | (4.89)<br>4.5      | (2.97)<br>2.12 | (6.72)<br>4.87     | (3.16)<br>1.57 |
| 6. R.Up.D. .. | 18 | (7.05)<br>5.5      | (5.00)<br>2.71 | (7.28)<br>5.00     | (3.49)<br>1.53 |

*Comparison with normals*

On *intro-punitiveness*, the two groups of patients with active depressive symptoms had higher scores than Philip's normals (sten scores 7.94 and 8.22), whereas the group with active manic symptoms, with a score of 6.33, was within the average range of 4.5-6.5. All the recovered groups also clustered around the mean score of Philip's normals.

On *extrapunitiveness*, only the active manic group, with a sten score of 7.67, was higher than Philip's normals.

*Comparison of active groups*

The scores of the three groups with active symptoms were compared by analysis of variance and t-test; the results are shown in Tables III and IV. The manic group had significantly lower *intro-punitiveness* and higher *extrapunitiveness* than either the unipolar or the bipolar depressives. The bipolar depressives had significantly lower *extrapunitiveness* scores than the unipolar depressives.

TABLE III

*Significance of difference in intro-punitiveness among ill groups*

| Comparisons     | Difference | S.E. Diff. | t    | p     |
|-----------------|------------|------------|------|-------|
| Bp.M. vs. Bp.D. | 1.61       | 0.77       | 2.09 | < .05 |
| Bp.M. vs. Up.D. | 1.89       | 0.67       | 2.81 | < .02 |
| Bp.D. vs. Up.D. | 0.28       | 0.77       | < 1  | N.S.  |

(d.f. = 100, two-tailed test)

TABLE IV

*Significance of difference in extrapunitiveness among ill groups*

| Comparisons     | Difference | S.E. Diff. | t    | p      |
|-----------------|------------|------------|------|--------|
| Bp.M. vs. Bp.D. | 2.78       | 0.55       | 5.09 | < .001 |
| Bp.M. vs. Up.D. | 1.67       | 0.54       | 2.18 | < .01  |
| Bp.D. vs. Up.D. | 1.11       | 0.55       | 2.96 | < .05  |

(d.f. = 100, two-tailed test)

*Comparison of recovered groups*

Of the six comparisons only that on *intro-punitiveness* between the recovered manics and the recovered bipolar depressives was statistically significant ( $t = 2.23$ ,  $p = 0.05$ ).

*Comparison of active and recovered groups*

An important question is whether the high levels of *intro-punitiveness* and *extrapunitiveness* found in the various ill groups are a consequence of the patients' illness or whether they reflect a more long-lasting feature of their personality. Some evidence regarding this can be obtained by comparing the scores of the ill and recovered patients of similar types. Of course, such comparisons had to be made with caution, since the present study is cross-sectional rather than longitudinal, and different patients were included in the ill and recovered groups. However, as noted above, the ill and recovered groups did not differ in age, sex and intelligence, and were drawn from the same hospital population, so that any effects of sampling differences would be relatively slight.

The results of these comparisons are shown in Table V. On *intro-punitiveness*, the recovered bipolar depressives had significantly lower scores than the actively ill bipolar depressives,

## THE PATTERN OF HOSTILITY IN AFFECTIVE ILLNESS

TABLE V  
*Differences between active and recovered groups*

|                         |  |  | Bp.M. | R.Bp.M. | S.E. Diff. | t    | p     |
|-------------------------|--|--|-------|---------|------------|------|-------|
| Intropunitiveness .. .. |  |  | 6.33  | 6.00    | 0.67       | <1   | N.S.  |
| Extrapunitiveness .. .. |  |  | 7.67  | 4.89    | 0.54       | 5.14 | <.001 |
|                         |  |  | Bp.D. | R.Bp.D. |            |      |       |
| Intropunitiveness .. .. |  |  | 7.94  | 4.50    | 0.77       | 4.46 | <.01  |
| Extrapunitiveness .. .. |  |  | 4.89  | 4.67    | 0.55       | <1   | N.S.  |
|                         |  |  | Up.D. | R.Up.D. |            |      |       |
| Intropunitiveness .. .. |  |  | 7.50  | 5.35    | 0.67       | 3.98 | <.001 |
| Extrapunitiveness .. .. |  |  | 6.00  | 5.00    | 0.54       | 1.85 | N.S.  |

(d.f. = 100, two-tailed test)

and the recovered unipolar depressives had significantly lower scores than those unipolar depressives with active symptoms; the difference between the ill and recovered manic groups was not significant.

On *extrapunitiveness*, the recovered manic patients had significantly lower scores than the active manic group, but neither of the other comparisons was statistically significant.

## DISCUSSION

The present results show that the manic patients tested had significantly higher extrapunitive scores than the two depressed groups, Philip's normals, and the group of recovered manics. In other words, they appear to channel their hostility predominantly outwards, criticizing others, projecting hostility and acting out hostility. Few psychiatric groups have been identified with a predominance of extrapunitive over intropunitiveness. According to the test manual (Caine *et al.*, 1967), only 'selected paranoids' are predominantly extrapunitive, i.e. paranoids with no history of depressive episodes. Even psychopaths become predominantly intropunitive when ill. Thus manics seem to be, with selected paranoids, the only psychiatric group which channels its hostility more outwards than towards the self. The comparison with the recovered manic group suggests that this high level of extrapunitive

is not a permanent feature of the personality of the manic patient, but may be specific to a period of his illness, the patient's level of extrapunitive reverting to normal as his manic symptoms remit. So far manics are the only group in whom it has been shown that such shifts in extrapunitive occur with recovery. Other studies have usually shown levels of extrapunitive to be fairly stable, while levels of intropunitiveness change with illness, behaving as what Foulds (1971) calls a state. The change in extrapunitive with mania reflects the importance and specificity of the illness.

Interestingly, the intropunitive score of the manics was average, not lower than average as might have been expected from the clinical stereotype of the happy-go-lucky, self-inflated manic patient. However, on recovery, the manic patients appeared to be somewhat more intropunitive than those who were formerly depressed, and this may reflect the sensitivity of this measure to the slight lowering of mood state common after recovery from a manic illness.

The two depressed groups had an equally high level of intropunitiveness, but the unipolar depressed group was significantly more extrapunitive than the bipolar depressed group, thus suggesting that the unipolar depressed group has a higher level of general hostility



than the bipolar depressed group. The recovered unipolar depressives had a higher level of both intropunitiveness and extrapunitiveness than the recovered bipolar depressives, though the difference was not significant. The changes that occurred with recovery in the two depressed groups agree very closely with Mayo's (1967) and Philip's (1971) results. Intropunitiveness decreased significantly to a normal level, while a slight non-significant drop occurred in extrapunitiveness.

The bipolar fashion in which hostility differentiates manics from bipolar and unipolar depressives seems to indicate its importance in the expression and perhaps the dynamics of these illnesses. Mood states seem to be associated strongly with changes in level of hostility and the direction in which this hostility is channelled. It cannot be determined from this study whether there is a causal relationship between mood states and hostility. Such a causal link could be of two kinds: depressed or elated moods might cause a person to construe himself or his environment as hostile, or else the construing of himself and/or of his environment in extremely hostile terms might cause him to develop an abnormal mood state. It seems that only follow-up studies at frequent intervals could help to elucidate this problem. They would establish how changes in hostility reflect changes in mood as self-rated or rated by an observer and also the temporal relationship between hostility pattern and changes in mood: does the manic's extrapunitiveness go up before his mood gets elated, and similarly does the depressive's intropunitiveness increase before his mood gets depressed? The HDHQ seems to be a sensitive enough measure with this group of patients to be able to suggest answers to these questions.

#### SUMMARY

Patients suffering from a bipolar or unipolar affective illness were tested on a measure of

hostility to differentiate between unipolar and bipolar depression and to study the pattern of hostility in mania. Unipolar and bipolar depressives were shown to differ on extrapunitiveness while manics differed from both types of depressives in extrapunitiveness and intropunitiveness. The changes occurring with recovery were also studied in each group. The role of hostility in affective illness is discussed.

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## A Temporal Measure of Attention in Schizophrenia and its Clinical Significance

By STANLEY R. KAY and MAN MOHAN SINGH

### INTRODUCTION

Disturbance of attention has been frequently suggested as one of the mechanisms underlying schizophrenic thought disorder (Weckowicz and Blewett, 1959; Chapman, 1961; Payne, 1966). Much effort has, therefore, been directed toward studying this variable in schizophrenia (McGhie, 1971; Neale and Cromwell, 1972). The approach undertaken has been determined by the psychophysiological and theoretical constructs presumed to be involved. To enumerate a few, disordered attention has been studied with indices of arousal (Venables, 1960; Venables and Wing, 1962), vigilance tasks (Mackworth, 1970), reaction time (Shakow, 1962), size constancy (Weckowicz and Blewett, 1959; Silverman, 1964a), tachistoscopic detection (Kornetsky, 1972), the WAIS Digit Span subtest (Blum *et al.*, 1969), and immediate recall (McGhie *et al.*, 1965). The lack of correspondence between these various procedures has become increasingly apparent (Neale and Cromwell, 1972). In one recent study, for example, the intercorrelations of five purported measures of attention ranged from  $-0.23$  to  $+0.31$  (Kopfstein and Neale, 1972).

The results have thus been conflicting and have largely failed to improve our understanding of the schizophrenic process and how its course is altered by therapeutic intervention. The basis of this problem seems two-fold. First, the construct of attention subsumes at least five mechanisms which may or may not covary in their functions. These include: (a) general alertness; (b) selective focusing; (c) flexibility in shifting focus; (d) central processing capacity; and (e) capacity to sustain focused alertness. The tendency to overlook these distinctions and to regard different components of attention as representative of a unitary construct may explain some of the inconsistent data.

A second limitation in the clinical study of attention has been the lack of objective procedures for validly and independently measuring defined aspects of attention. The techniques reported in the literature rely upon perceptual alertness or short-term memory, with attention presumably manifest as an interfering factor. However, unless deficit of attention is gauged directly and in isolation of other variables the data will be interpretable in terms of constructs other than attention. Particularly for purposes of studying the role of attention in schizophrenic thought disorder one requires a measure of attention that is not deduced by observation of cognitive-perceptual performance.

The object of the present study was to develop a measure of attention that answers to the above criticisms. The proposed *Span of Attention Test* deals specifically with the aspect of attentional processes related to sustaining focused alertness. This temporal component has been virtually ignored in studies with schizophrenics, yet clinically their difficulty in concentration and distractibility by internal and external stimuli seem to be of major importance. The Span of Attention Test was designed to objectively gauge this disorder with a task involving minimal perceptual and cognitive demands. The test obtains a direct temporal measure based on attention spans sampled in performing a standard task. The index is empirically determined by the average length of time, over two trials, that the subject is observed to sustain concentration during routine motor performance.

### TEST PROCEDURE

The Span of Attention Test is administered in a quiet room with doors and windows closed to minimize external distraction. The material consists of a standard page filled with 500 X's, arranged as 25 rows each with 20 X's separated by dashes. This

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paper is placed on a table directly before the subject, who is given a sharpened pencil and instructed as follows:

"Here you have a page filled with X's. I would like you to put a circle around each X on this page. Start here [examiner points to upper left corner] and go in order from left to right without skipping over any X's. Have you any questions?"

The task may be further clarified upon request, but no information concerning the parameters under study may be offered, as this would invalidate the conditions of testing. After instructions, the test administrator demonstrates circling of the first three or four X's. Once assured that the directions have been understood, he instructs the subject to 'Start', and times the performance with a stopwatch held out of view. The examiner takes note of any break in attention during the test, as evidenced by the subject looking up or away from the test sheet or discontinuing the task for at least ten seconds. On the first two occasions that the span of attention is broken, the subject is instructed to continue working, and the exact times of such occurrences are recorded. The test is terminated approximately 30 seconds after the second break in attention, this additional time serving the purpose of camouflaging the critical measure under study as well as the basis for task discontinuation. A maximum time of 400 seconds is allotted for the test and is considered its ceiling, since pilot data have found all non-psychotic adults sampled capable of completing the test within this time limit. Administration time may thus vary from 0 to 400 seconds.

The Span of Attention Test score is calculated in the following way:

(1) Attention Span Broken Twice. If attention is interrupted twice before the test sheet has been completed or 400 seconds have elapsed, the score is the average of the two spans, i.e. the composite time (in seconds) recorded at the second break in attention, divided by two.

(2) Attention Span Broken Once. If only one break in attention is observed during 400 seconds or before completion of the test sheet, the subject is credited with the number of seconds recorded at this break in attention, or 400 minus this number, whichever score is the greater one.

(3) Attention Span Unbroken. If no break in attention span is evidenced for 400 seconds or before completion of the test sheet, the subject is credited with a maximal score of 400 (seconds).

#### METHOD

##### *Subjects*

The study involved a total of 89 subjects encountered over a three-year period as patients or staff

of a clinical psychopharmacology research unit. These included: (a) 23 *chronic schizophrenics* (10 males, 13 females, ages 19-46), patients with duration of illness four years or longer since the first clear indication of psychosis, (b) 20 *sub-acute schizophrenics* (10 males, 10 females, ages 18-36), patients with duration of illness two to four years, (c) 23 *acute schizophrenics* (11 males, 12 females, ages 19-47), patients with duration of illness less than two years, and (d) 23 *non-psychotic adults* (7 males, 16 females, ages 18-49), psychiatric aides and nurses. The patients were selected for unequivocal diagnosis of schizophrenia and no evidence of organicity, addiction, or alcoholism. Of the 66 schizophrenics, 23 (8 chronic, 10 sub-acute, 5 acute) were diagnosed as paranoid, 42 (15 chronic, 10 sub-acute, 17 acute) as non-paranoid, and one not assigned any diagnostic subclassification. Clinical observation suggested that the severity of illness ranged from moderate to extreme, with a wide variety of schizophrenic symptoms displayed as a whole.

##### *Design*

The investigation was carried out as part of a series of double-blind multidimensional studies of the therapeutic effects of neuroleptics in treating schizophrenia. The setting was a psychiatric hospital research unit which provided a closed environment with a structured schedule of activities that remained standard for the duration of the programme. As part of the patients' scheduled activities, the Span of Attention Test was administered by a psychologist (S.R.K.) once a week in conjunction with a battery of tests measuring cognitive processes. Forty-three of the 66 patients (20 chronic, 8 sub-acute, 15 acute, 22 males, 21 females) were evaluated once a week through a period of 14 to 16 weeks; 10 (2 chronic, 4 sub-acute, 4 acute, 4 males, 6 females) were tested only twice; and 13 (1 chronic, 8 sub-acute, 4 acute, 5 males, 8 females) were tested once. The non-psychotic subjects, all of whom were unfamiliar with the Span of Attention Test and its rationale, were given this measure once.

##### *Evaluative procedures*

In addition to the Span of Attention Test, 18 of the schizophrenic patients (5 chronic, 3 sub-acute, 10 acute, 8 males, 10 females) were evaluated by means of psychiatric interviews, ratings of arousal, and cognitive tests. Patients were interviewed on alternate weeks for about 60 minutes by the professional staff (one psychiatrist and three psychologists), who thereafter rated them on 32 dimensions of psychopathology along a seven-point scale, ranging from 1 (absence of pathology) to 7 (extreme pathology).

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Each dimension, as well as the rating criteria for four focal points on the scale, representing mild, moderate, severe, and extreme, were defined. The diagnostic evaluation included cognitive-attentional processes, social functioning, communication, affect, ego integration, delusions and hallucinations.

In assessing level of arousal, measures were regularly taken of pulse rate, sleeplessness and chloral hydrate sedation. A resting pulse count was taken each morning after rising. Nine hourly ratings of sleeplessness were carried out every night along a five-point scale, ranging from 0 for 'fast asleep' to 4 for 'walking around'. Ratings of sedation following administration of 500 mg. chloral hydrate were conducted twelve times at quarter hour intervals, three afternoons per week, along a ten-point activity scale that ranged from 'maniacal 0 ('fast asleep') to 9 ('maniacal excitement')'.

Cognitive assessment included weekly administration of the Color Form Representation Test (CFR)\* and Egocentricity of Thought Test (EOT).† Both procedures were designed within a developmental framework for kinetic study of cognitive structure. The CFR, involving a series of similarity judgements, evaluates cognitive organization on the basis of hierarchical attributes used for categorization. The EOT, adapted from Piaget's (1928) study of right-left conceptual development, provides an index of subjectivity, socialization, and objectivity of thought processes.

## RESULTS

### Discriminative validity

The mean spans of attention for the four groups, reported in Table I, reflected greater test impairment for the schizophrenics, particularly those with long-term history of illness. The significance of the difference was corroborated by a one-way analysis of variance ( $F = 19.81$ , d.f. =  $3/85$ ,  $p < .001$ ). While Scheffé's (1953) *a posteriori* comparisons did not find the scores of the patient groups to differ significantly from one another, non-psychotic subjects performed substantially better than each of the schizophrenic groups (Table I).

The difference in Span of Attention data for the 23 paranoid and 42 non-paranoid schizo-

phrenics was studied with a *t* test. The result ( $t = 1.97$ , d.f. = 63,  $p < .06$ ) showed the paranoid ( $\bar{X} = 176$  sec.) to score significantly higher than the non-paranoid ( $\bar{X} = 107$  sec.) schizophrenics.

TABLE I

*Scheffé's a posteriori comparisons of means by schizophrenic and non-psychotic groups on the Span of Attention Test*

|                         | Chronic<br>schiz.<br>N = 23<br>$\bar{X} =$<br>101 sec. | Sub-acute<br>schiz.<br>N = 20<br>$\bar{X} =$<br>139 sec. | Acute<br>schiz.<br>N = 23<br>$\bar{X} =$<br>167 sec. | Non-<br>psychotic<br>adults<br>N = 23<br>$\bar{X} =$<br>371 sec. |
|-------------------------|--------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------------|
| Chronic<br>schiz. . .   |                                                        | .94                                                      | 3.02                                                 | 50.07*                                                           |
| Sub-acute<br>schiz. . . |                                                        |                                                          | .50                                                  | 34.26*                                                           |
| Acute<br>schiz. . .     |                                                        |                                                          |                                                      | 28.50*                                                           |

\* Significance difference,  $p < .001$ .

### Criterion-related validity

The Span of Attention Test as an arousal-based measure was studied by Pearson correlation with the related research data collected for 18 of the schizophrenic patients during their first week of treatment. The results indicated a significant relationship between Span of Attention scores and clinical ratings of distractibility ( $r = .59$ ,  $p < .01$ ), pulse rate ( $r = .49$ ,  $p < .05$ ), sleeplessness ( $r = .52$ ,  $p < .05$ ), and resistance to chloral hydrate sedation ( $r = .48$ ,  $p < .05$ ). At the same time, consistent with the relationship observed between overarousal and withdrawal in schizophrenia (Tizard and Venables, 1957; Venables, 1960; Venables and Wing, 1962), significant correlations were obtained with clinical ratings of passive/apathetic withdrawal ( $r = .57$ ,  $p < .02$ ), hostile/fearful withdrawal ( $r = .58$ ,  $p < .02$ ), preoccupied/autistic behaviour ( $r = .63$ ,  $p < .01$ ), verbal withdrawal ( $r = .50$ ,  $p < .05$ ), and uncooperativeness ( $r = .61$ ,  $p < .01$ ). None of the other investigated dimensions of psychopathology correlated significantly with the test data.

### Reliability for longitudinal use

The reliability of the Span of Attention Test was studied with scores achieved by the 53

\* S. R. Kay, M. M. Singh, and J. M. Smith: 'Color Form Representation Test: A development method for the study of cognition in schizophrenia.' (Unpublished manuscript, 1974).

† S. R. Kay and M. M. Singh: 'A developmental approach to delineate components of cognitive dysfunction in schizophrenia.' (Unpublished manuscript, 1974).

schizophrenics who were retested on this measure. Pearson analysis of the first two test administrations, separated by a one-week interval, revealed a correlation of .67 ( $p < .001$ ). The susceptibility of the Span of Attention Test to influences of familiarity, practice, and learning was investigated on the basis of the same data, which were collected during a period when patients were on placebo, hence not expected to show appreciable change. A correlated  $t$  test found non-significant deterioration in scores from Week 1 to 2 ( $t = .28$ , d.f. = 52,  $p > .10$ ), showing the test to be an adequately stable measure.

#### *Sensitivity to change*

The Span of Attention Test as an index of therapeutic change was studied with the data of those 43 schizophrenics, who were repeatedly tested through 14 weeks of neuroleptic treatment. The chronic group ( $N = 20$ ) showed only moderate change in psychopathology during treatment, resulting in a 50 per cent discharge rate. Their week-by-week Span of Attention scores (Fig. 1) correspondingly reflected a non-significant positive trend ( $p = .23$ , Cox-Stuart test of trend, Cox and Stuart, 1955), with no significant test difference between initial and final administrations ( $t = 1.19$ , d.f. = 19,  $p > .10$ , correlated  $t$  test). The sub-acute and acute patients ( $N = 23$ ), in contrast, showed substantial improvement in psychopathology, resulting in a 91 per cent discharge rate. Their weekly Span of Attention scores (Fig. 1) produced a significant positive trend ( $p = .06$ , Cox-Stuart test of trend), with the final test scores significantly superior to those obtained on the initial administration ( $t = 2.70$ , d.f. = 22,  $p < .02$ , correlated  $t$  test).

#### *Clinical application*

The clinical usefulness of the Span of Attention Test was illustrated by its prognostic significance in the study of schizophrenic thought processes. Among the 43 patients studied longitudinally with the Span of Attention Test, 36 were assessed weekly on the Color Form Representation Test (CFR) and Egocentricity of Thought Test (EOT) through a period of 16 weeks. This group was divided

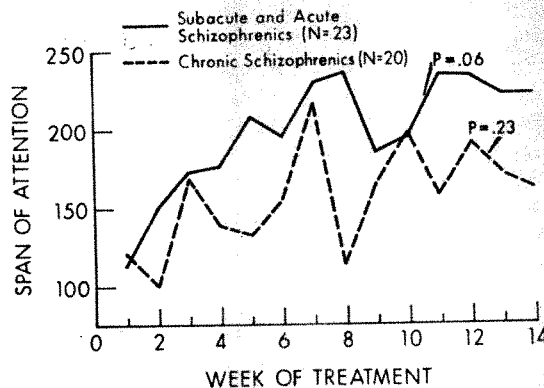


FIG. 1.—Longitudinal changes in attention span in the chronic vs. sub-acute and acute schizophrenic patients—effects of neuroleptic treatment. The results of Cox-Stuart tests of trend are indicated.

into the 18 patients (6 chronic, 5 sub-acute, 7 acute) with lower baseline attention span ( $\bar{X} = 30$  sec.) and the 18 patients (7 chronic, 3 sub-acute, 8 acute) with relatively higher baseline attention span ( $\bar{X} = 224$  sec.). It was observed that the group with more severe attentional deficit improved significantly in cognitive functioning ( $p < .005$ , Cox-Stuart test of trend), as monitored by weekly administration of the CFR and EOT. The group with relatively good baseline attention, in contrast, showed no significant trend on either of these cognitive measures ( $p > .10$ , Cox-Stuart test of trend). This finding suggests that the Span of Attention Test may be of value in identifying schizophrenics who are likely to show cognitive gains with pharmacological treatment.

#### DISCUSSION

Analysis of Span of Attention scores by schizophrenic and non-schizophrenic subjects suggested that the test: (a) distinguishes between these two populations; (b) differentiates paranoid and non-paranoid schizophrenics; (c) is correlated with measures of distractibility, arousal and withdrawal, but not with other dimensions of psychopathology; (d) provides a reliable and stable index of change; and (e) reflects the differential course of chronic vs. sub-acute and acute schizophrenics. When used in conjunction with cognitive measures, the Span of Attention Test appeared to be of prognostic value in distinguishing schizophrenics

whose cognitive performance improved with pharmacotherapy (short baseline attention span) from those who showed no change (longer baseline attention span). One explanation of this finding postulates a dual nature to schizophrenic thought disorder.\* One factor, possibly based in defective development of cognitive structure ('primary' cognitive disorder), was found to be drug-resistant, while the other factor, apparently related to attentional disturbance and hyperarousal ('secondary'), was drug-sensitive. According to this formulation, gross attentional disturbance has a disruptive and disorganizing effect on cognitive processes which, in contradistinction to primary structural deficits, can be reversed by antipsychotic agents as the arousal system is brought under control.

The finding of a significant difference between non-psychotic and schizophrenic subjects on the Span of Attention Test is of particular interest in the light of the paucity of studies on temporal aspects of attention. For example, this factor is not mentioned in the Posner and Boies (1971) analysis of attentional components, nor in Lang and Buss's (1965) literature review, from which they concluded that '... when the irrelevant stimuli are few, the task stimulus is intense and unequivocal, or any collateral inputs are temporally in phase ... chronic schizophrenics may approach the functioning level of normal subjects' (p. 82). Data from the present study suggest that in terms of ability to sustain attention schizophrenic patients show marked deficit even under near-optimal conditions.

While the test showed greater attentional disturbance for those patient groups with a longer history of illness, the differences were not statistically significant. This result may be viewed from two perspectives. On experimental grounds, there have emerged no consistent patterns of data relating arousal to chronicity in schizophrenia (Lang and Buss, 1965; McGhie, 1971). A wide range of arousability has been noted in early psychosis (Herrington and Claridge, 1965), and greater sleep disturbance has been found among acute than among chronic schizophrenics (Singh and Smith, 1973). The work of Silverman (1964a, 1964b) suggests

\* M. M. Singh and S. R. Kay, unpublished MS.

that a more critical distinction is to be made between non-paranoid and paranoid schizophrenics, the latter group showing a selectivity of attention and resistance to extraneous stimulation exceeding that of normal subjects. The data from the present study tend to support this distinction, showing the paranoid schizophrenics to sustain focused alertness for longer durations than non-paranoid schizophrenics.

The failure to obtain significant differences between acute, sub-acute, and chronic patients may, on the other hand, be a function of limitations in the Span of Attention Test design. Since the measure involves prolonged motor performance, the role of motivation must be critically examined. In addition, it is evident that the task requirement disfavours those with psychomotor disturbance, notably the catatonic schizophrenics. To safeguard the construct validity of the test, it is suggested that the speed of test performance should be assessed and used to screen patients with obvious psychomotor deficiency or lack of motivation. A further problem inherent in the routine task requirement is that its performance may be facilitated by a propensity for repetitive, stereotyped activity. Since stereotypy of thoughts and behaviour is a prominent feature in severely ill and chronic schizophrenics, the capacity of these subjects to sustain attention may be overestimated with the present design. Conversely, the supranormal ability of paranoid schizophrenics to resist distraction, as postulated by Silverman (*op. cit.*), may go undetected because of the artificial restriction imposed by the test ceiling.

Further studies are at present being conducted to refine the test measure and relate it to other aspects of attentional deficit. The following approaches are being undertaken: (a) use of a more varied task to reduce motor fatigue and eliminate the advantage of stereotypic tendencies; (b) presentation of test material on a rotating cylinder that is individually adjusted to a suitable rotation speed, as determined by psychomotor functioning on independent tests; (c) elimination of ceiling restriction by observing continuous performance on the rotating cylinder until at least two breaks in attention are evidenced; (d) administration of the test in conjunction with interfering auditory and visual stimuli.



## SUMMARY

The Span of Attention Test was developed as a temporal measure of concentration and distractibility for studies with schizophrenics. The evaluation is determined by the average length of time one sustains attention at a routine motor task. Because the measure is not dependent on perceptual skills or short-term memory it is considered appropriate for studying the role of attention in cognitive dysfunction. The clinical value of the test was investigated by administration to 66 schizophrenic patients and 23 non-psychotic adults. Cross-sectional analyses found the test to distinguish between schizophrenics and non-schizophrenics, and between paranoid and non-paranoid schizophrenics, and revealed significant correlations with indices of distractibility, arousal, and withdrawal. Longitudinal study showed the test to be a reliable instrument that monitors the differential course of chronic *vs.* sub-acute and acute schizophrenics and may have prognostic significance for schizophrenic thought disorder.

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## 'Psychoticism' and Psychotic Illness

By F. M. McPHERSON, A. S. PRESLY, JENNIFER ARMSTRONG and R. H. CURTIS

This study concerns the scores on a questionnaire measure of 'Psychoticism' of patients with a diagnosed psychotic illness.

Eysenck (1952) postulated the existence of three main dimensions of personality—Extraversion, Neuroticism and Psychoticism. The label 'Psychoticism' was used to suggest the hypothesis: 'that there exists a set of correlated behaviour variables indicative of predisposition to psychotic breakdown, demonstrable as a continuous variable in the normal population and independent of E and N (Eysenck and Eysenck, 1968a). Psychotically ill patients are held to mark the extreme end of this dimension.

Although Psychoticism was measured originally by various experimental tasks (e.g. Eysenck, 1956), several recent articles have described the development of a set of questionnaire items for its measurement (Eysenck and Eysenck, 1968a, b; 1969; 1972). This scale has appeared in several versions, a recent one comprising 29 items. Eysenck and Eysenck (1972) state that among the features required of a satisfactory measure of P are those of: '(1) differentiating between psychotic and neurotic subjects, (2) differentiating between psychotic and normal subjects, (3) being independent of E and N, and (4) having sufficient reliability to be useful for experimental purposes.' One purpose of the present study is to evaluate the 29 item P scale in terms of these criteria.

While P scale scores would thus be expected to distinguish psychotic patients as a group from non-psychotics, differences might also be predicted *within* the psychotic group. Foulds (1965) and Foulds and Bedford distinguish between 'integrated' and 'non-integrated' psychotic patients. Both classes of psychotic are distinguished from non-psychotic patients by the presence of delusions. 'Integrated' delusions are those of persecution, self-denigration and grandeur; these delusions, although bizarre, nevertheless imply that the patient remains capable

of distinguishing between self and environment and to some extent of intending his own actions. The 'non-integrated' psychotic may report 'integrated' delusions, but in addition may express delusions which seem to imply a breakdown of the boundary between self and other and a disturbance of the patient's awareness of himself as agent. Auditory hallucinations, delusions of thought insertion and of thought broadcasting and delusions of bodily disintegration are examples of the delusions of 'non-integrated' psychotics, who also tend to exhibit thought disorder, and disorders of affect such as flattening and incongruity. Only schizophrenic patients, but not all schizophrenics, are in the 'non-integrated' class of psychotics. Differences in Psychoticism might be expected between groups of 'integrated' and 'non-integrated' psychotics, although there is no previous evidence on which to base a prediction regarding which group would have the higher scores.

Verma and Eysenck (1972) suggested that differences within the psychotic group might also be related to a second personality variable, Extraversion. In particular, they argued that introverted psychotics are likely to show more social withdrawal (Venables and Wing, 1962). Although Verma and Eysenck produced some evidence for this relationship, they did not assess social withdrawal directly, nor the related feature described by Venables (1957), activity withdrawal.

A second general aim of the present study is to test hypotheses relating Psychoticism and Extraversion to differences within a group of psychotic patients.

### METHOD

#### *Psychotic patients*

This group comprised 77 patients who: (1) in the opinion of their consultant psychiatrist had a firmly diagnosed psychotic illness (schizo-

phrenic, paranoid, manic or depressive) with no evidence of brain damage; (2) were in-patients; (3) were aged 17-65 inclusive; (4) had scores of 15 or more on the Mill Hill Synonyms Selection Test; and (5) were testable and co-operative. However, not all 77 were included in every part of the study. These 77 had the following specific diagnoses: *schizophrenic*—47; *paranoid*—5; *manic*—9; *depressive*—16. The features of the groups are shown in Table I.

Approximately one third of the patients were tested within one month of admission, although most had had at least one previous admission. The full psychiatric histories were available for 61 patients. Of these, 12 were within one year of their first contact with a psychiatrist. In the 61 as a whole the mean time since first contact was 12.27 years (S.D. 8.91, range 0.04-36.64 years) and the mean total time spent in hospital was 9.15 years (S.D. 7.97, range 0.04-27.20 years).

Because of the chronicity of many of the patients, no attempt was made to assess social class.

#### Personality questionnaire

The questionnaire was administered individually. Devised by S. B. G. Eysenck and H. J. Eysenck, and as yet unpublished, it comprises 101 items, including a 29 item Psychoticism scale, a 22 item Extraversion scale, a 23 item Neuroticism scale and a 21 item Lie scale.

Approximately eight weeks after the first administration, 57 patients were retested (mean interval 56 days, range 49-63 days).

#### Psychotic signs and symptoms

*Social withdrawal and activity withdrawal.* Sixty of the psychotic patients, including 45 schizophrenics, were rated by an experienced nurse

who knew him or her well. Social Withdrawal was rated on the scale devised by Wing (1961), and Activity Withdrawal on that devised by Venables (*ibid.*).

*Signs of 'non-integrated' psychosis.* The nurse also rated four psychotic signs as either present or absent: Flattening of Affect, Incongruity of Affect and Positive and Negative Thought Disorder. These signs are among those used by Foulds (*ibid.*) to define 'non-integrated' psychosis. The distinction between the 'positive' and 'negative' forms of thought disorder was made by Fish (1962) and contrasts the more bizarre phenomena, such as knight's move, neologisms and word salads with the apparent 'inability to think' shown by vagueness, blocking, etc.

The meaning of the terms and the use of the rating scales were discussed with each rater; however, no estimate of the reliability of the ratings could be made.

*'Integrated' and 'non-integrated' delusions.* Thirty-five patients completed a symptom questionnaire being developed by Foulds and Bedford and derived from the Symptom Sign Inventory (Foulds and Hope, 1968). It comprises 104 items relating to neurotic and psychotic symptoms, including 30 'integrated' delusions (persecution, grandeur, self-denigration) and 20 'non-integrated' delusions.

#### RESULTS

The Psychoticism, Extraversion, Neuroticism and Lie scale scores of the groups are shown in Table II.

#### Features of the questionnaire

*Intercorrelation of scales.* The intercorrelations (Pearson *r*) among the four scales are shown in

TABLE I  
Age, synonym test scores and sex of schizophrenic, paranoid, manic and depressive patients

|                  | N  | M : F   | Age  |      |       | Synonyms test |      |       |
|------------------|----|---------|------|------|-------|---------------|------|-------|
|                  |    |         | Mean | S.D. | Range | Mean          | S.D. | Range |
| Schizophrenic .. | 47 | 28 : 19 | 41.8 | 12.8 | 17-65 | 24.2          | 5.8  | 16-44 |
| Paranoid ..      | 5  | 2 : 3   | 43.8 | 4.9  | 40-52 | 21.8          | 3.4  | 17-25 |
| Manic ..         | 9  | 6 : 3   | 50.0 | 12.0 | 23-60 | 24.6          | 3.0  | 20-40 |
| Depressive ..    | 16 | 6 : 10  | 48.0 | 12.3 | 24-65 | 30.7          | 6.0  | 22-41 |



TABLE II

*Scores of four psychotic groups on Psychoticism, Extraversion, Neuroticism and Lie scales*

|                     | N  | Psychoticism |      | Extraversion |      | Neuroticism |      | Lie   |      |
|---------------------|----|--------------|------|--------------|------|-------------|------|-------|------|
|                     |    | Mean         | S.D. | Mean         | S.D. | Mean        | S.D. | Mean  | S.D. |
| Schizophrenic .. .. | 47 | 4.93         | 3.37 | 10.21        | 4.85 | 11.61       | 6.33 | 13.10 | 5.22 |
| Paranoid .. ..      | 5  | 6.40         | 5.17 | 8.80         | 4.32 | 14.40       | 2.30 | 12.80 | 4.43 |
| Manic .. ..         | 9  | 6.22         | 3.77 | 11.33        | 5.72 | 15.89       | 5.75 | 10.44 | 5.85 |
| Depressive .. ..    | 16 | 4.00         | 3.63 | 10.93        | 5.82 | 13.88       | 5.58 | 12.13 | 5.84 |

Table III. Psychoticism scores correlated significantly with both E and L, although both correlations were small.

TABLE III

*Correlation coefficients (Pearson  $r$ ) among Psychoticism, Extraversion, Neuroticism and Lie scale scores in 77 psychotic patients*

|      | E      | N     | L      |
|------|--------|-------|--------|
| P .. | +0.28* | 0.00  | -0.33† |
| E .. | —      | -0.13 | -0.38† |
| N .. | —      | —     | -0.07  |

\*  $P < 0.05$ ; †  $P < 0.01$

*Stability.* The 57 patients who were retested did not differ from the total sample of 77 in age, sex, or Synonyms test score, or in their initial scores on the personality test scales. Their scores on the two occasions are shown in Table IV. All four test-retest correlations were

TABLE IV

*Test-retest stability of Psychoticism, Extraversion, Neuroticism and Lie scale scores of 57 psychotic patients over eight weeks*

|              |      | Testing 1 | Testing 2 | $r_{1-2}$ |
|--------------|------|-----------|-----------|-----------|
| Psychoticism | Mean | 5.14      | 4.64      | +0.73     |
|              | S.D. | 3.47      | 3.33      |           |
| Extraversion | Mean | 10.59     | 10.73     | +0.69     |
|              | S.D. | 4.61      | 4.83      |           |
| Neuroticism  | Mean | 12.43     | 12.22     | +0.85     |
|              | S.D. | 5.89      | 5.66      |           |
| Lie          | Mean | 13.08     | 13.36     | +0.84     |
|              | S.D. | 5.14      | 5.10      |           |

highly significant; none of the differences in mean scores on the two occasions approached significance.

*Patient variables*

Four patient variables were considered—age, Synonyms test score, sex and chronicity.

*Age.* P scale scores showed a small, although statistically significant correlation with age ( $N = 77$ ;  $r = -0.23$ ;  $p < 0.05$ ), i.e. there was a slight tendency for older patients to have lower scores. E, N and L did not correlate significantly with age.

*Synonyms test.* The correlation between P scores and scores on the Synonyms Selection test was just below statistical significance ( $N = 77$ ;  $r = -0.20$ ); none of the correlations with the other scales approached significance.

*Sex.* The mean P scores of the 42 male psychotics and the 35 females were, respectively, 5.55 (S.D. 4.04) and 4.31 (S.D. 2.89). The groups did not differ significantly and were therefore combined in subsequent calculations. The males and females also did not differ significantly on E, N or L.

*Chronicity.* In the 61 patients for whom information was available, P scale scores correlated only  $-0.03$  with Total Time in Hospital since first admission, and  $-0.02$  with Time Since First Contact with a psychiatrist. Extraversion and Neuroticism also showed very small correlations with each measure, but scores on the Lie scale correlated  $+0.36$  ( $p < 0.01$ ) with Total Time in Hospital and  $+0.22$  (n.s.) with Time Since First Contact.

*Comparison of subgroups*

The four groups who together comprised the psychotic group did not differ significantly in age or Synonyms test scores. Their scores on the personality test scales are shown in Table II. Comparison of these scores is not really justified, because of the small number in some of the

groups and because of probable sampling differences due to different admission policies etc. in the various groups. However, the groups differed significantly on none of the scales.

#### *Comparison of psychotic, neurotic and normal groups*

The scores of the psychotic group were therefore considered together, and were compared with the scores of two other groups—neurotics and normals. The *neurotics* comprised 35 in-patients and out-patients with a firmly diagnosed neurotic condition, who were aged 17–65 inclusive and had scores of 15 or more on the Synonyms test. The *normals* comprised 112 hospital workers and students, aged 17–65, with Synonyms test scores of 15 or more. Neither of the groups differed significantly from the psychotics in age, Synonym test scores, or in the proportion of males in the group.

The scores of the psychotics, neurotics and normals are shown in Table V.

*Psychoticism.* Although the psychotics had the highest mean score, the groups did not differ significantly ( $F = 0.38$ ; d.f. = 2,221; n.s.).

*Extraversion.* On Extraversion, on the other hand, overall comparison showed significant differences among the groups ( $F = 4.85$ ; d.f. = 2,221;  $p < 0.01$ ) the psychotics being significantly less extraverted than the normals ( $t = 4.90$ , d.f. = 110;  $p < 0.01$ ), although the psychotics and neurotics did not differ significantly.

*Neuroticism.* The groups differed very significantly on Neuroticism ( $F = 29.29$ ; d.f. = 2,221;  $p < 0.001$ ) the neurotic patients having

the highest score, differing significantly from the normals ( $t = 10.80$ ; d.f. 145;  $p < 0.01$ ) and from the psychotics ( $t = 4.23$ ; d.f. = 110;  $p < 0.01$ ) who in turn differed significantly from the normals ( $t = 6.59$ ; d.f. = 187;  $p < 0.01$ ).

*Lie scale.* The three groups also differed significantly on the Lie scale ( $F = 5.031$ ; d.f. = 2,221;  $p < 0.01$ ). The psychotics had significantly higher scores than the normals ( $t = 15.20$ ; d.f. = 187;  $p < 0.01$ ) and than the neurotics ( $t = 2.60$ ; d.f. = 110;  $p < 0.05$ ); the neurotics and normals also differed significantly ( $t = 7.50$ ; d.f. = 145;  $p < 0.01$ ).

In view of the well known difficulty in distinguishing between psychotic and neurotic depression, the depressive group is probably the least satisfactorily defined of the four psychotic groups. The mean scores were therefore recalculated excluding the 16 depressives. The scores of the combined schizophrenic, paranoid and manic groups are also shown in Table V. The effect of excluding the depressives is slight.

*Relation to specific psychotic signs.* The Psychoticism scores of those psychotic patients who were rated as showing, and of those who were rated as not showing, each of the four signs indicative of 'non-integrated' psychosis are shown in Table VI.

For all four signs, those patients showing the sign had the higher P scale scores. In the case of affective flattening ( $t = 2.67$ ; d.f. = 58;  $p < 0.01$ ) and positive thought disorder ( $t = 2.14$ ; d.f. = 58;  $p < 0.05$ ) the differences

TABLE V  
*Scores of psychotics, neurotics and normals on Psychoticism, Extraversion, Neuroticism and Lie scales*

|                                        | N   | Psychoticism |      |       | Extraversion |      |       | Neuroticism |      |       | Lie   |      |       |
|----------------------------------------|-----|--------------|------|-------|--------------|------|-------|-------------|------|-------|-------|------|-------|
|                                        |     | Mean         | S.D. | Range | Mean         | S.D. | Range | Mean        | S.D. | Range | Mean  | S.D. | Range |
| Psychotic patients                     | 77  | 4.98         | 3.50 | 0-18  | 10.40        | 5.07 | 0-21  | 12.89       | 6.03 | 1-23  | 12.57 | 5.35 | 0-21  |
| Neurotic patients                      | 35  | 4.69         | 3.06 | 0-14  | 10.88        | 6.79 | 1-22  | 17.00       | 4.72 | 4-23  | 10.23 | 5.00 | 1-18  |
| Normals                                | 112 | 4.54         | 3.42 | 0-18  | 12.66        | 4.89 | 0-22  | 9.34        | 5.16 | 0-21  | 5.73  | 4.08 | 0-20  |
| Psychotics<br>excluding<br>depressives | 61  | 5.25         | 3.57 | 0-18  | 10.30        | 4.90 | 0-21  | 12.47       | 6.18 | 1-23  | 12.69 | 5.27 | 0-21  |

TABLE VI  
*Psychoticism scale scores of patients with and without four psychotic signs*

|                           |         | Psychoticism |      |      |
|---------------------------|---------|--------------|------|------|
|                           |         | N            | Mean | S.D. |
| Affective flattening      | With    | 39           | 6.41 | 3.36 |
|                           | Without | 21           | 2.05 | 1.39 |
| Incongruous affect        | With    | 30           | 6.40 | 3.94 |
|                           | Without | 30           | 3.36 | 2.34 |
| Negative thought disorder | With    | 33           | 6.35 | 3.98 |
|                           | Without | 27           | 3.14 | 2.24 |
| Positive thought disorder | With    | 32           | 6.56 | 3.68 |
|                           | Without | 28           | 3.00 | 2.81 |

were significant. No significant differences, or systematic trends, were found on the E, N or L scales.

When the scores of the 45 schizophrenic patients were analysed separately, similar findings were obtained. Those schizophrenics with each of the four signs had higher P scale scores than those without. In the case of affective flattening, the differences were statistically significant (means of 6.42 and 2.21;  $t = 2.10$ ; d.f. = 43;  $p < 0.05$ ). Again no significant differences were found on the other three scales.

'Integrated' and 'non-integrated' delusions. For various practical reasons, the Symptom Questionnaire was administered to only 35 psychotic patients. These patients did not differ significantly from the total sample of 77 in age, Synonyms test score, proportion of males in the group, or in their scores of P, E, N or L.

To exclude defensive patients who answered 'no' to every question, only those were included who endorsed at least three non-delusional items on the questionnaire. To exclude extreme 'yes-sayers', only patients who admitted to fewer than 30 non-delusional symptoms were included (i.e. about 50 per cent of the total such items). Eight patients were thus excluded. The remaining 27 were divided into three groups: those who admitted to no delusions; those who admitted only to 'integrated' delusions (persecution, grandeur, self-denigration); and those who admitted to 'non-integrated' delusions. Of the 11 patients in the 'non-integrated' group, all but two admitted also to 'integrated' delusions. The three groups

did not differ in age or Synonyms test scores. The Psychoticism scores of the three groups are shown in Table VII.

TABLE VII  
*Psychoticism scale scores of psychotic patients with 'non-integrated' delusions, 'integrated' delusions and no delusions*

|                          |    | Psychoticism |      |      |
|--------------------------|----|--------------|------|------|
|                          |    | N            | Mean | S.D. |
| Non-integrated delusions | 11 | 6.82         | 3.31 |      |
| Integrated delusions     | 8  | 4.38         | 2.13 |      |
| No delusions             | 8  | 2.63         | 2.00 |      |

The three groups differed significantly on Psychoticism ( $F = 5.95$ ; d.f. = 2.14;  $p < 0.01$ ), the 'non-integrated' group having the highest scores, followed by those with 'integrated' delusions. There were no differences on E, N and L.

*Social and activity withdrawal.* The distribution of scores on both these measures allowed correlations (Pearson  $r$ ) to be calculated with the scores on the personality scales. In the sample of 60 patients, the correlation between Social Withdrawal and Extraversion was in the predicted direction but failed to reach significance ( $r = -0.23$ ). The correlations with P, N and L were very small. Insignificant correlations were also found when the 32 male and 28 female patients were considered separately.

The correlation between Activity Withdrawal and Extraversion was  $-0.12$ . Those with P, N and L were also insignificant, and within the male and female groups separately the correlations were also small.

## DISCUSSION

The first question which must be considered is how far the psychotic patients had sufficient understanding of the task and awareness of their own behaviour, for their answers to a questionnaire to have any validity. Although many of the patients were very thought-disordered, it did not appear to the testers that any patient was answering entirely at random. The pattern of scores also suggests that few, if any, patients were answering randomly. The P, E and N scale

scores of the psychotics were all quite similar in mean, variance and range to those of the normals and neurotics; also, the mean P scale scores of the psychotics was well below the 'chance score' of 14 or 15. However, the Lie scale scores of the psychotics were very high. While this appears to suggest a great deal of 'dissimulation', it is not clear why this did not also affect Neuroticism scores, and it may be that the Lie scale does not measure 'dissimulation' in chronic psychotics. Alternative explanations are suggested by the correlation between Lie scale scores and chronicity, e.g. that it may reflect lack of insight, lack of awareness of social norms, or the extreme social conformity of many chronic patients.

Whatever the reason, since P and E both correlated significantly and negatively with L, the consequences may have been to reduce scores of the psychotic group on these scales. Because of the many imponderables involved, no attempt was made to correct P and E scores to take account of any such effects.

#### *Features of the questionnaire*

With regard to the independence of P and E, and to the stability of P scores over time, this 29 item Psychoticism scale appears to have advantages over previous versions.

*Independence of scales.* In the psychotic group, P was independent of N and correlated only slightly with E. In the present neurotic and normal groups, P and N, and P and E were also independent. This is in contrast to the high correlations found by Verma and Eysenck (*ibid.*) between P and N (+.53 in females, and +.66 in males; both  $p < 0.01$ ) in a psychotic group.

*Stability over time.* This version of the P scale is very stable, in the present study being even more stable than Extraversion. The test-retest correlation of +.73 is in contrast to that of only +.53 reported by Verma and Eysenck (*ibid.*) over approximately the same period. Twenty of the original 77 psychotics were not retested, the majority because they had either improved sufficiently to be discharged or else had deteriorated and become untestable. The 57 retested patients were thus quite stable clinically, and this probably contributed to the high

test-retest reliability. The chronicity of the group, however, seems not to have been important, since when the 12 patients who were within one year of their first psychiatric contact were considered separately, a very similar test-retest correlation was found for P ( $r = +0.75$ ).

The one factor which probably contributed to the greater stability of this version compared with that of Verma and Eysenck is the larger number of items in this version (29 rather than 20).

*Patient variables.* The present results suggest that, in a psychotic population, vocabulary level, age and sex are not important influences on P scale scores. Although there was a tendency for older patients to score lower than younger and for females to score lower than males, the differences were not statistically significant. Similar, but insignificant, tendencies were also found within the neurotic and normal groups. Of course, the relatively restricted range of age and vocabulary levels studied, and the various sources of sample bias, make conclusions drawn from the present data only tentative. S. B. G. Eysenck (personal communication) has found that, in a normal standardization group, age and sex both have an important influence on P scale scores.

The absence of significant correlations between the measures of *chronicity* and P is indirect evidence against the suggestion of Verma and Eysenck (*ibid.*) that high Psychoticism scores may indicate a poor prognosis. According to that view, a chronic group would be expected to contain a greater proportion of high P scale scorers than an acute group, thus giving a positive correlation between P and chronicity. However, the many confounding variables, such as the correlation of Lie scale scores and chronicity, as well as sampling bias, make this conclusion also tentative.

#### *Comparison of Psychotic and Non-psychotic groups.*

*Psychoticism.* Since psychotically ill patients are held to mark the extreme end of the Psychoticism scale, the psychotic group in the present sample would have been expected to have significantly higher P scale scores than either the neurotics or the normals. However, this was not found. The mean scores of all three

groups were similar to those of the normals quoted in the standardization data. In contrast, Verma and Eysenck (*ibid.*) reported that the earlier version did discriminate significantly between psychotics and non-psychotics, although the differences in the mean scores of the groups were relatively small. There are no obvious explanations of the different results of the two studies. The present sample was probably the more chronic, and the subjects were also on average ten years older, but neither factor seems sufficient to account for the discrepant findings. Many of the present patients were receiving medication—either antidepressants or phenothiazines—which may have reduced their P scale scores, although the effect of such drugs on personality traits, as opposed to clinical signs and symptoms, is unknown. There were too many confounding variables for the effects to be tested directly.

The effect of excluding the depressives is to increase the mean P score of the psychotic group, but only slightly.

*Extraversion.* The finding that the psychotics were slightly more introverted than the normals was similar to those of Verma and Eysenck (*ibid.*), Claridge (1967) and Eysenck and Eysenck (1964), although not of Bolton and Savage (1971) in an EPI study of elderly patients and normals.

*Neuroticism.* The present results, along with those of Verma and Eysenck (*ibid.*), Claridge (*ibid.*) and Eysenck and Eysenck (1964), suggest that psychotics score somewhat higher on Neuroticism than normals. On the other hand, Bolton and Savage (*ibid.*) and Al-Issa (1964), who studied chronic schizophrenics, found lower than normal N scale scores.

*Lie scale.* The very high Lie scale scores of the psychotics, in comparison to those of the neurotics and normals, are of great importance to the interpretation of the results of the other scales, since in the present study L correlated significantly and negatively with both E and P. As suggested above, the correlation with chronicity raises the probability that—at least in psychotic patients—the high scores on the scale may be associated with something other than dissimulation. This is clearly an important area for future research.

#### *Relation to specific psychotic signs*

*Social withdrawal and activity withdrawal.* The finding that neither of these variables correlated significantly with Extraversion fails to support the hypothesis of Verma and Eysenck (*ibid.*). The present data suggest no explanations of these negative findings.

*Integrated and non-integrated psychosis.* In contrast, the results suggest an association between Psychoticism and the 'integrated'—'non-integrated' psychosis distinction (Foulds, *ibid.*; Foulds and Bedford). According to Foulds (*ibid.*) the 'non-integrated' group are distinguished from the 'integrated' psychotics by the presence of thought disorder, affective disorders such as flattening, and delusions of 'non-integration'. The present results showed that patients rated as having affective flattening and positive thought-disorder had significantly higher P scale scores than those in whom these signs were absent. Patients who, on the Symptom Questionnaire, admitted to delusions of 'non-integration' had higher P scale scores than those admitting only to 'integrated' delusions and to other signs and symptoms.

Foulds (*ibid.*) argues that the clinical signs of 'non-integration' are secondary to a disorder of interpersonal relationships, which he describes as 'lack (of) the intention or motive to enter into mutual personal relationships' (p. 312), and it is interesting to speculate on how this disorder might relate to Psychoticism.

Of course, the reliability of the Symptom Questionnaire and of the ratings is unknown, and the number of patients who completed the former was small, so that the present results do no more than suggest a possible line of future research.

#### *'Psychotism' and psychotic illness*

If Psychoticism is associated with psychotic illness in the way suggested by Eysenck and Eysenck (1968a), and if this questionnaire is a valid measure of Psychoticism, it would have been expected that the psychotic group would have markedly higher P scale scores than the neurotics and normals. However, the P scores of the psychotics were only slightly higher.

Several explanations were possible. The biological basis of Psychoticism is uncertain,



but it is possible that the level of Psychoticism might have been affected by the phenothiazine drugs which most of the psychotic patients were taking. Also, the psychotic group might have contained a number of non-psychotics whose scores reduced the mean P score. Exclusion of the depressives, the group most likely to contain non-psychotics, did increase P scores slightly. Some of the schizophrenics did not appear to have any of the traditional psychotic signs such as delusions or thought disorder, although presumably they had had these at one time. Inspection of the scores of those patients who were undoubtedly showing psychotic features, e.g. those who admitted to 'non-integrated' delusions, or who were rated as thought-disordered, shows that their scores were higher than those of the other psychotics.

Another possibility is that, although the normals, neurotics, and psychotics, had approximately the same total P scale scores, they endorsed different items on the scale. This could readily be tested by item analysis, but a greater number of subjects would be required than were used in the present study.

It may be, on the other hand, that Psychoticism is related to differences *within* classes of disorder, i.e. within psychosis, neurosis and personality disorder, rather than *between* classes, i.e. psychosis *versus* non-psychosis. In other words, it may not be associated with predisposition to develop psychotic illness, but instead may affect the type of psychosis, neurosis or personality disorder which occurs. Thus, individuals with high Psychoticism might, in the event of a psychotic breakdown, develop a 'non-integrated' type of illness, characterized by affective flattening, thought disorder and delusions of 'non-integration', whereas individuals with low Psychoticism might develop integrated psychoses, marked by delusions of persecution or self-denigration. This hypothesis would account for the finding in the present results whereby P scores differentiate very much better within the psychotic group, between 'non-integrated' and 'integrated' psychotics, than between either psychotics as a group and non-psychotics, or 'non-integrated' psychotics and non-psychotics. For example, the mean P scores of those psychotics with and without

positive thought disorder are 6.56 and 3.00 respectively, whereas that of the normal group was 4.54.

This hypothesis would also help to explain the persistent finding that some non-psychotic groups obtain higher P scores than do psychotic groups, e.g. prisoners (Eysenck, 1970), some drug users (Teasdale *et al.*, 1971) and alcoholics (Presly, unpublished data). A prediction from the alternative hypothesis would be that differences in the type of signs and symptoms which *neurotic* patients show might also be associated with Psychoticism. It is intended to test this prediction.

A final point is that some authors (e.g. Claridge and Chappa, 1973) have suggested that it might be possible to test theories relating to psychotic illness on normals who have high Psychoticism scores. The present findings suggest that such attempts would be premature.

#### SUMMARY

A 29 item Psychoticism scale was administered to 77 psychotic patients. Scores were largely unaffected by age, vocabulary and sex; P scale scores were independent of N, although not of E and L, and were stable over time. P scale scores did not discriminate between the psychotics and 35 neurotics and 112 normals. However, within the psychotic group, those patients who had delusions of 'disintegration', thought disorder and affective flattening had significantly higher scores than those psychotics without these signs.

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## What Does the P Scale Measure?

By HILTON DAVIS

### INTRODUCTION

Beginning with the hypothesis that 'there exists a set of correlated behaviour variables indicative of predisposition to psychotic breakdown, demonstrable as a continuous variable in the normal population, and independent of E and N' (H. Eysenck and S. Eysenck, 1968), the Eysencks have been concerned to develop a questionnaire scale to measure such a variable. From an initial pool of potential items, hypothesized to be related to psychoticism, several factor analyses of adult responses have been conducted to obtain a small group of items measuring a factor orthogonal to the factors of neuroticism and extraversion, and these items have been called the Psychoticism or P Scale (H. Eysenck and S. Eysenck, 1968; S. Eysenck and H. Eysenck, 1968; S. Eysenck and H. Eysenck, 1972). The same arguments have been applied to children, and a similar set of items have been assembled to measure this variable (H. Eysenck and S. Eysenck, 1971; H. Eysenck, G. Easting and S. Eysenck, 1971; S. Eysenck and H. Eysenck, 1969).

Five criteria were given (S. Eysenck and H. Eysenck, 1968) for selecting the final items for the P scale, '(1) high loadings on the factor in question; (2) consistency of loadings over different samples and sexes; (3) low loadings on factors not being measured; (4) consistency of loadings from three-factor solution to third-order solution; (5) known previous loadings in earlier analyses on different factors . . .'. However, these criteria appear to have been applied in an extremely loose way. By careful study of their tables of factor loadings (H. Eysenck and S. Eysenck, 1968; S. Eysenck and H. Eysenck, 1968; S. Eysenck and H. Eysenck, 1969; S. Eysenck and H. Eysenck, 1972) it can be seen that far fewer items than were actually selected conform to the stated criteria. Consequently, it is not surprising to find that factors

N and P have not been consistently orthogonal; for example, factor correlations between N and P have been as high as 0.45 (S. Eysenck and H. Eysenck, 1968). Nor has consistency in reliability been found, and reliability figures as low as 0.57 have been quoted (S. Eysenck and H. Eysenck, 1970).

Although the questionnaire scale has been persistently called Psychoticism, or P for those not convinced, virtually no reasonable validation evidence has been presented. The content of the items suggests behaviour more characteristic of psychopaths than of psychotics, although it is true that concessions have been made in this direction (S. Eysenck and H. Eysenck, 1972). In support of the validity of the scale patients diagnosed as psychotic have been found to score significantly higher than controls (Eysenck, 1970; Eysenck, 1972, Verma and Eysenck, 1973). However, other groups, including criminals (S. Eysenck and H. Eysenck, 1970; S. Eysenck and H. Eysenck, 1971), drug users (Teasdale, Segraves and Zacune, 1971), and in-patient neurotics (Verma and Eysenck, 1973), have been found to score at about the same level as psychotics. The findings that masculinity, sexuality and P are colinear (Eysenck, 1971a) and that high P scores are related to sexual pathology and high libido (Eysenck, 1971b) provide little evidence to support the interpretation of the P scale as a measure of psychoticism.

The most recent attempt to demonstrate the validity of the scale is the study by Verma and Eysenck (1973). The investigation involved a factor analysis of a variety of measures administered to a sample of psychotic patients. Primary factors were extracted and rotated to oblique simple structure, and higher order factors were derived. In the summary, it was concluded that three major factors appeared, and these were named Psychoticism, Extraversion and Age.



Although it was not made clear how age was a *major* factor, since there were only two super-order factors, this is unimportant for the present purpose. What is important is that the interpretation of the factors is demonstrably subjective, misleading, and consequently in line with the hypothesis. The interpretation of the first super-order factor as 'degree of psychotic illness' is circular, since this conclusion is drawn from the fact that P has the highest loading, even though P has never been demonstrated to be related specifically to psychotic behaviour. The second super-order factor was identified as Extraversion even though the E scale had a loading of only  $-.31$ , whereas the N scale loaded to the extent of  $0.61$  and was the second highest loading. If there was little justification for calling this factor Extraversion, there was even less justification for the statement that it was 'measuring *type* of psychotic illness', since there was no evidence at all supporting such a conclusion. A further disturbing interpretation involved the primary factors, the first of which was 'identified rather confidently as one of Psychoticism', even though the argument is circular and hostility scales had by far the highest loadings.

The present study was therefore conducted because of dissatisfaction with previous data and the conclusions drawn from them, and because of the need for independent replication. The P scale was used on a sample of abnormal offenders in a maximum security hospital: (1) to determine whether it was a measure of a unitary factor; (2) to investigate its relationship to other inventory measures; and (3) to determine whether it would discriminate between psychotic and non-psychotic offenders.

#### METHOD

##### *Subjects*

The subjects for the study were 103 testable male patients who were admitted to a Special Hospital for abnormal offenders during the period from March 1972 to March 1973. Three of the subjects were classified under the Criminal Procedure (Insanity) Act 1964 as 'under disability' and the remainder under the 1959 Mental Health Act (37 were classified under Psychopathic Disorder, 31 under Mental Illness, 24 under Subnormality and the rest under

various combinations of these). The mean age of the sample was 26.3 years (S.D. 9.0 years) and mean WAIS Full Scale IQ was 80.2 (S.D. 13.6).]

##### *Experimental variables*

A routine battery of tests was administered to each patient within four weeks of admission, although, for reasons beyond the control of the experimenter, not all the results were available for all the subjects. The tests included in the battery are listed immediately below. The means and standard deviations of the measures can be found in Table I.

TABLE I  
*Means and standard deviations of the questionnaire measures*

|         | Scale        | Mean  | Standard deviation |
|---------|--------------|-------|--------------------|
| EWPI    | N            | 9.52  | 5.52               |
|         | E            | 13.52 | 4.05               |
|         | L            | 4.80  | 2.87               |
| P scale | P (32 items) | 8.28  | 3.60               |
|         | P (20 items) | 6.21  | 3.13               |
| SHAPS   | L            | 6.35  | 2.79               |
|         | A            | 19.12 | 9.39               |
|         | Ex           | 22.79 | 6.06               |
|         | Ho           | 14.16 | 6.00               |
|         | I            | 7.54  | 3.60               |
|         | D            | 7.62  | 4.04               |
|         | T            | 7.93  | 3.99               |
|         | Pd           | 24.57 | 5.27               |
|         | Im           | 15.27 | 5.45               |
|         | Ag           | 13.48 | 6.70               |

- (1) *Wechsler Adult Intelligence Scale* (Wechsler, 1955)  
The full WAIS was administered to all subjects, unless it had previously been used within about 18 months prior to admission.
- (2) *Eysenck-Withers Personality Inventory*  
This inventory was administered according to the manual (Eysenck, 1966) to provide measures of N (Neuroticism), E (Extraversion) and L (Dissimulation).
- (3) *The P scale*  
The scale used in this study was composed of the first 20 items that have been suggested (S. Eysenck and H. Eysenck, 1968) plus 12 items that were published later (S. Eysenck and H. Eysenck, 1972). To enable comparisons with results obtained from other studies, the distribution parameters have been calculated for both the 20-item scale and the 32 item scale.

However, for the purpose of the item and scale analyses, the 32-item version of the scale was used.

(4) *Special hospitals assessment of personality and Socialization (SHAPS)*

Designed for work with abnormal offenders, this is an inventory which consists of ten scales derived mainly from the MMPI, but also from the Buss-Durkee Hostility Inventory and the Peterson-Quay Psychopathy Factor Scale. The actual scales are the Lie scale (L), the Psychopathic Deviate scale (Pd), both from the MMPI (Hathaway and McKinley, 1967), an anxiety scale (A) (Welsh, 1956) and an extraversion scale (Ex) (Giedt and Downing, 1961), Tryon's scales of Introversion (I), Depression (D) and Tension (T) (Tryon, 1966), an impulsivity scale (Im) (Blackburn, 1971) and unpublished factor scales of hostility (Ho) and aggression (Ag) devised by Blackburn.

*Data analysis*

The analysis of the data was carried out in several ways. Firstly, the reliability of the P scale was calculated, using the Kuder-Richardson Formula 20. The separate items were then checked individually to find those that had been endorsed by less than 10 per cent or more than 90 per cent of the sample. Five items with less than 10 per cent endorsement were discarded for the purposes of the second analysis, which was a principal components analysis of P, N and E items. Following Eysenck's approach (e.g. S. Eysenck and H. Eysenck, 1968), the first three factors were rotated to oblique simple structure, using the method of Jennrich and Sampson (1966). This procedure was carried out in an attempt to replicate previous findings, in that the P items were expected to load a single factor and to be unrelated to N and E. The items used in the analysis are listed in the Appendix. Six N items and six E items which in previous analyses have been found to be relatively consistent measures of their respective factors were used as markers of these two factors. The third analysis was conducted to investigate how the P scale would fit into the factor structure usually found in questionnaire scale analyses. In terms of Eysenck's theory one would expect P to define a factor separate to those found previously. That is to say, one would expect a factor defined by P, as well as an emotionality factor, an extraversion factor and a factor loaded highly by the lie scale (e.g. Blackburn, 1971; Blackburn, 1972).

All the questionnaire scales were therefore inter-correlated to produce a matrix of product-moment correlation coefficients, which was then subjected to a principal components analysis. Those factors with

eigenvalues greater than unity were then rotated into oblique simple structure, again using the Jennrich and Sampson method.

The final part of the study involved a comparison of the P scores of 18 psychotic patients (independently diagnosed by two psychiatrists) individually matched for intelligence with 18 non-psychotic patients. The reason for matching on IQ alone and not age was that P and age were found to be unrelated ( $r = -0.02$ ), whereas the correlations between P and WAIS Verbal IQ and Full Scale IQ were  $-0.46$  and  $-0.44$  respectively ( $p < 0.01$ ). This comparison was carried out to investigate whether the P scale measured anything common to psychotics.

## RESULTS

### *Reliability of P*

The Kuder-Richardson Formula 20 yielded a reliability coefficient of 0.61. This figure is rather low considering that the scale, which has 32 items, is longer than the usual P scale.

### *Item factor analysis*

Table II contains the matrix of rotated factor loadings, the variance accounted for by the factors, and the factor intercorrelations. The first factor is identifiable as the Neuroticism factor, since the six marker items for this factor all have high loadings. The second factor is clearly an Extraversion factor marked by the six extraversion items. If we consider only those items with loadings greater than 0.25, 13 P items load the third factor significantly, although some of them do not load in the same direction as in Eysenck's data. If one tried to form a scale of these items using only two of Eysenck's criteria (S. Eysenck and H. Eysenck, 1968), high loadings on the factor in question and low loadings on factors not being measured, then one would retain only 5 items (nos. 4, 5, 10, 16 and 30), not all of which would be keyed in the direction given by Eysenck. Although the factors were independent, the interpretation of the third factor is far from clear; however, the possibility could be considered that it is either an extrapunitive hostility factor or a factor related to the locus of control concept (Rotter, 1966).

### *Scale factor analysis*

Three factors with eigenvalues greater than

## WHAT DOES THE P SCALE MEASURE?

TABLE II

Matrix of the loadings (decimal point omitted) of P, N and E items on three factors rotated to oblique simple structure, percentage variance accounted for by each factor and factor intercorrelations

| Item no.            |    | Factor 1 | Factor 2 | Factor 3 |
|---------------------|----|----------|----------|----------|
| <i>P items</i>      |    |          |          |          |
| 1                   | .. | -558     | -033     | 368      |
| 4                   | .. | 103      | 074      | -466     |
| 5                   | .. | -150     | 009      | -581     |
| 6                   | .. | -329     | -023     | -456     |
| 7                   | .. | -319     | 045      | 049      |
| 9                   | .. | -511     | -174     | 020      |
| 10                  | .. | 014      | -035     | -396     |
| 11                  | .. | -430     | -030     | 123      |
| 12                  | .. | -395     | -015     | 011      |
| 13                  | .. | -164     | 125      | -097     |
| 14                  | .. | -279     | -074     | -280     |
| 15                  | .. | -513     | -018     | -075     |
| 16                  | .. | 049      | -070     | -461     |
| 17                  | .. | -452     | -173     | -171     |
| 18                  | .. | -394     | 182      | -361     |
| 19                  | .. | -400     | 218      | 069      |
| 20                  | .. | -030     | -320     | 407      |
| 21                  | .. | -333     | 142      | 335      |
| 22                  | .. | 062      | -671     | 080      |
| 24                  | .. | -452     | 120      | 436      |
| 25                  | .. | -307     | -305     | -078     |
| 26                  | .. | 039      | -200     | 182      |
| 27                  | .. | 202      | -190     | -077     |
| 28                  | .. | 268      | -105     | -024     |
| 29                  | .. | 268      | 004      | 387      |
| 30                  | .. | -027     | 039      | 549      |
| 32                  | .. | -066     | -036     | 125      |
| <i>N items</i>      |    |          |          |          |
| 33                  | .. | -422     | -299     | 059      |
| 34                  | .. | -569     | -031     | -135     |
| 35                  | .. | -272     | -298     | -175     |
| 36                  | .. | -415     | -368     | -107     |
| 37                  | .. | -355     | -275     | -105     |
| 38                  | .. | -387     | -054     | -397     |
| <i>E items</i>      |    |          |          |          |
| 39                  | .. | -377     | 407      | 012      |
| 40                  | .. | -118     | 693      | 189      |
| 41                  | .. | 069      | 608      | -067     |
| 42                  | .. | 155      | 692      | -140     |
| 43                  | .. | 108      | 604      | -107     |
| 44                  | .. | -110     | 339      | 217      |
| % variance          | .. | 11       | 8        | 7        |
| Factor correlations | F2 | 0.03     | —        | —        |
|                     | F3 | 0.05     | 0.05     | —        |

TABLE III

Matrix of questionnaire factor loadings (decimal point omitted) rotated to oblique simple structure, percentage variance accounted for by each factor and factor intercorrelations

| Variable            | Factor 1 | Factor 2 | Factor 3 |
|---------------------|----------|----------|----------|
| N                   | ..       | -651     | 134      |
| E                   | ..       | -019     | -907     |
| L (EWPI)            | ..       | -175     | -113     |
| P                   | ..       | -860     | -045     |
| L (MMPI)            | ..       | 172      | 090      |
| A                   | ..       | -848     | 006      |
| Ex                  | ..       | 080      | -904     |
| Ho                  | ..       | -858     | -106     |
| I                   | ..       | -661     | 494      |
| D                   | ..       | -752     | 110      |
| T                   | ..       | -766     | 062      |
| Pd                  | ..       | -300     | 032      |
| Im                  | ..       | -319     | -405     |
| Ag                  | ..       | -433     | -131     |
| % variance          | ..       | 50       | 17       |
| Factor correlations | F2       | -0.10    | —        |
|                     | F3       | -0.44    | -0.05    |

unity emerged from the analysis of the fourteen variables. The matrix of the rotated factor loadings is shown in Table III. The results are very much in line with what was expected. Ignoring P for the moment, the first factor has high loadings on A, Ho, D, T, and N and can be interpreted as Emotionality, the second factor, which loads E and Ex, is clearly an Extraversion factor, and the third factor has high negative loadings on the L scales and a high positive loading on Im. As in previous analyses, factors 1 and 2 are orthogonal (correlation = -0.10), whereas factors 1 and 3 are quite closely related to the extent of -0.44. Turning to the P scale, it will be seen that it has the highest loading of all the variables on factor 1. It would seem, therefore, that P is simply another measure of Emotionality.

#### Psychotic vs. non-psychotic comparison

No significant difference was found on P between the 18 psychotics and 18 non-psychotics (individually matched within one IQ point), using the t-test for related samples. The mean

for the psychotics was 9.0 and the mean for the control group was 8.89.

Various other comparisons were made, but the only result of particular interest is that the mean P score for sex-offenders was not significantly different from a control group of non-sex offenders (sex-offender mean = 8.38; control mean = 8.48). This is of interest in view of a previous finding that sex offenders score more highly on P than non-sex offenders (Eysenck, 1971a).

#### DISCUSSION

The findings of the present study indicate that P is a rather unreliable scale, whose items do not measure a unitary factor orthogonal to N and E. The scale is found to be highly correlated with the factor generally called Emotionality, and does not discriminate psychotic from non-psychotic offenders. It is thought that the results are not surprising in view of the unjustified assumptions that have been made, the confusing and inconsistent statement of the arguments and the questionable logic.

Eysenck's basic assumption, even though he rejects the traditional medical model, is that there exists a class of behaviours which are distinct from all other types of behaviour and which are called psychotic. Such an assumption is logically permissible, but one must doubt its usefulness, since this class is broad, ill-defined and unreliably observed, and no consistent similarities have been found amongst psychotic individuals. Furthermore, the assumption of a single dimension of psychosis is falsified by the work of Lorr, Klett and McNair (1963) whose results indicate a multidimensional symptom structure.

Another point to be questioned is the assumption that the putative personality dimension of psychoticism exists in all individuals, whether normal or abnormal. If one assumes, with Eysenck, that the P scale measures this dimension, then the finding that P had a J-shaped distribution in the normal population (Claridge and Chappa, 1973) goes some way to falsifying his argument. It is incumbent upon Eysenck to demonstrate that the hypothesized dimension of psychoticism exists in the normal population,

but the way this has been done is of rather questionable logic. A series of items were administered to non-psychotic individuals, and their responses were analysed by extracting three factors, the third of which was called Psychoticism. Such a procedure assumes the truth of the hypothesis, since the only justification for the interpretation of the third factor as psychoticism is that the original items were pre-selected from scales purporting to measure psychosis or were written for the purpose. This justification is very weak, since scales like the MMPI Schizophrenia scale have very high loadings on the factor generally called Emotionality and are poor at discriminating psychotics from non-psychotics. Secondly, it is very difficult to understand how psychoticism items can be written, since the behaviours involved in the measurement of the trait are not defined (items referring to classical psychotic behaviour are excluded) and the authors' ability to predict the psychotic's responses to items is likely to be very poor, since uncertainty is introduced by such factors as thought disorder, poor self-judgement, etc.

If one were to accept the psychoticism hypothesis as imaginative theory building in the Popperian tradition, and to accept that there could exist an adequate measure of such a dimension, the fact that several non-psychotic groups score as highly on P as psychotic groups should make one doubt that the P scale measures it. Perhaps Gray's suggestion (Gray, 1971) that P '... has something to do with an excessive degree of intra-specific aggressive behaviour...' might have more to commend it in that aggressive responses might be more prevalent amongst out-groups. However, it is thought that a more likely interpretation of the P scale is that it is a measure of the tendency to evaluate oneself and others in a negative manner, i.e. a measure of the semantic dimension of evaluation. This interpretation gains support from (1) the content of the items, which broadly reflects a tendency to be negative by admitting maladjustment and having hostile attitudes towards others, (2) the Verma and Eysenck study (1973) where P was found to be highly correlated with N and with measures of hostility, and where the first primary and first super-order factors

might be interpreted as hostility, and (3) the results of the present study, in which P and measures of emotionality and hostility all load a single factor. The finding of a relationship between emotionality and hostility is certainly not new, since it has been previously demonstrated by Bendig (1961) and Blackburn (1972), who stated that '... concepts of hostility, punitiveness or neuroticism appear to have an identical referent'.

In conclusion, therefore, it would seem likely that P is simply a broader measure than N of the semantic dimension of evaluation, which is an interpretation of the major questionnaire factor that has gained much support in recent years (e.g. Hallworth, 1965; Peterson, 1965; Mischel, 1968).

#### SUMMARY

This study was conducted to investigate the validity of the questionnaire scale of Psychoticism, since the arguments for constructing the scale appear to be rather questionable and the data in support of the scale unsatisfactory. One hundred and three patients in a hospital for abnormal offenders were tested with Eysenck's P, N, E and L scales as well as with personality scales derived mainly from the MMPI. The results indicate that: (1) P is rather unreliable; (2) the items of the P scale do not consistently mark a factor separate from neuroticism and extraversion; (3) only 5 items meet the criteria for use as a scale; and (4) the P scale is found to be a good measure of the factor generally called Emotionality. A comparison of 18 psychotics with 18 non-psychotic offenders, matched individually for intelligence, resulted in no differences on P. Theoretically, it is argued that the concept of psychoticism as a personality dimension is based on unjustified assumptions. On the basis of the present results and previous research it is concluded that the evidence falsifies the hypothesis that the P scale is a measure of a dimension of psychoticism, but that it might be construed as a measure of a broad semantic dimension of evaluation.

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16. Was your father a good man? N
17. Do people mean to say and do things to annoy you? Y
18. Would you have been more successful if people had not put difficulties in your way? Y
19. When you are in a crowded place like a bus do you worry about dangers of infection? Y
20. Would it upset you a lot to see a child or animal suffer? N
21. Do you think that marriage is old-fashioned and should be done away with? Y
22. Can you easily understand the way people feel when they tell you their troubles? N
- \*23. Would you like to think that other people are afraid of you? Y
24. Do you enjoy practical jokes that can sometimes really hurt people? Y
25. Have you always been known as a loner? Y
26. Would you feel very sorry for an animal caught in a trap? N
27. Are you always specially careful with other people's things? N
28. Do you try not to be rude to people? N
29. Do you sometimes get cross? N
30. Do good manners and cleanliness matter much to you? N
- \*31. Did you mind filling in this questionnaire? Y
32. Have you ever told a lie? N

## APPENDIX

*P scale items:* (Scored direction indicated by Y (= Yes) or N (= No).) Those items marked with an asterisk were not used in the item analysis.

1. Do most things taste the same to you? Y
- \*2. Do you enjoy hurting people you love? Y
- \*3. Are you generally in good health? N
4. Was your mother a good woman? N
5. Have you had more trouble than most? Y
6. Have you had an awful lot of bad luck? Y
7. Do you worry a lot about catching diseases? Y
- \*8. Did you love your mother? N
9. Are there several people who keep trying to avoid you? Y
10. Is there someone who is responsible for most of your troubles? Y
11. Do you let your dreams warn or guide you? Y
12. Do people generally seem to take offence easily? Y
13. Would you take drugs which may have strange or dangerous effects? Y
14. Do you have enemies who wish to harm you? Y
15. Do your friendships break up easily without it being your fault? Y

*N items used in item analysis*

33. Do you ever feel 'just miserable' for no good reason? Y
34. Do you worry about awful things that might happen? Y
35. Have you often felt tired for no good reason? Y
36. Do you often feel fed-up? Y
37. Do you sometimes feel life is just not worth living? Y
38. Are you often troubled with guilty feelings? Y

*E items used in item analysis*

39. Do you like plenty of excitement going on around you? Y
40. Are you rather lively? Y
41. Can you get a party going? Y
42. Do you like mixing with people? Y
43. Can you usually let yourself go and enjoy yourself at a gay party? Y
44. Do you like going out a lot? Y

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## The Repetition of Parasuicide: A Comparison of Three Cohorts

By DOROTHY BUGLASS and JOHN HORTON

For some years we have monitored a steady increase in the rates for parasuicide (attempted suicide) in Edinburgh (Aitken *et al.*, 1969; Kreitman, 1972). Some changes in the character of the group have been demonstrated; in particular, the proportion of young people admitted has increased. The proportion readmitted within 12 months has, however, remained constant at around 15 per cent. Identification of potential repeaters is dependent on the group possessing characteristics which remain consistent over time. In this paper the characteristics of both repeaters and non-repeaters are compared over a three-year period, and stable predictors of repetition are identified. An earlier study (Buglass and McCulloch, 1970) suggested that prediction of repetition was best considered separately for each sex. This question is reconsidered in the light of new data. Thirdly, the interaction between the type of disposal recommended after the parasuicidal episode and subsequent repetition is examined.

### METHOD

Since 1968, standard information on all admissions to the Edinburgh Regional Poisoning Centre has been recorded on punched cards. Persons admitted in 1968, 1969 and 1970 as the result of a parasuicidal act were selected for study. Each calendar year was treated as a separate cohort. A person's first admission in a particular year was termed his 'key' admission. Individuals in the cohorts were followed up from records for twelve months from the date of their key admission. Those readmitted to the R.P.C. or who committed suicide (ascertained from Edinburgh public health department) were termed repeaters. Demographic, clinical and social characteristics of the repeaters were compared with those of non-repeaters in each cohort. These characteristics comprised 24

personal attributes, 3 which referred to illness or suicidal behaviour in the patient's relatives and 2 to arrangements made for his care after discharge from the R.P.C. Items which consistently discriminated repeaters were identified.

### RESULTS

The numbers of patients in the three cohorts were 847 in 1968, 910 in 1969 and 1,052 in 1970. The proportion of repeaters were respectively 16 per cent, 14 per cent and 17 per cent. Men were more likely to repeat than women, though in 1970 this difference was no longer statistically significant.

Table I shows the items on which comparison was made. The items which consistently discriminated repeaters from non-repeaters at a highly significant level were: a diagnosis of sociopathy, problems in the use of alcohol, previous in-patient psychiatric treatment, previous out-patient psychiatric treatment, and previous parasuicide. Items which were consistently associated with repetition above the 5 per cent level of significance were: belonging to Social Class V, dependence on drugs, unemployment, and a history of criminal behaviour. Eight items, including a diagnosis of depression and having taken alcohol at the time of the act were not related to repetition in any cohort.

The remaining items were associated with repetition in some years but not in others. The greater risk for 1968 patients after referral to social work care is probably explained by the experimental policy in that year of offering high-risk patients social work support, however slight the likelihood of modifying their subsequent behaviour (Chowdhury *et al.*, 1973). The proportion referred for social work in 1968 was more than twice as high as in subsequent years.

In earlier years the age-group 25-44 was more liable to repetition than younger or older

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  4. Brit. J. Psych. (1971), 115, 239-3.
  5. Ibid. (1973), 122, 566.
  6. Curr. Med. Res. and Opin. (1974), 2, 73-39.
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TABLE I

*Comparison of repeaters and non-repeaters on 29 items*\* indicates items associated with repetition at the .05 level, \*\* at the .01 level and \*\*\* at the .001 level of significance ( $\chi^2$  test)

|                                                      | 1968 | 1969 | 1970 |
|------------------------------------------------------|------|------|------|
| <i>Personal attributes</i>                           |      |      |      |
| Male sex .. ..                                       | *    | *    | —    |
| Separated or divorced ..                             | *    | —    | —    |
| Social class V .. ..                                 | ***  | **   | *    |
| Diagnosis of depression ..                           | —    | —    | —    |
| Diagnosis of sociopathy ..                           | ***  | ***  | ***  |
| Problem in use of alcohol ..                         | ***  | ***  | ***  |
| Alcohol taken at time of act                         | —    | —    | —    |
| Drug dependent .. ..                                 | *    | ***  | ***  |
| Previous in-pt. psychiatric treatment .. ..          | ***  | ***  | ***  |
| Previous out-pt. psychiatric treatment .. ..         | ***  | ***  | ***  |
| Previous parasuicide resulting in hospital admission | ***  | ***  | ***  |
| Previous parasuicide not admitted to hospital ..     | ***  | ***  | —    |
| Separated from mother when under 10 years ..         | *    | **   | —    |
| Separated from father when under 10 years ..         | —    | —    | —    |
| Not living with relatives ..                         | ***  | —    | *    |
| Violence used .. ..                                  | ***  | ***  | —    |
| Violence received .. ..                              | *    | —    | —    |
| Four or more dwelling changes in past 5 years ..     | **   | ***  | —    |
| Less than 1 year at present address .. ..            | —    | —    | —    |
| Overcrowded .. ..                                    | —    | —    | —    |
| Unemployed .. ..                                     | ***  | **   | ***  |
| In debt .. ..                                        | —    | —    | —    |
| Criminal record .. ..                                | ***  | ***  | **   |
| Aged 25-44 years .. ..                               | **   | *    | —    |
| <i>Family attributes</i>                             |      |      |      |
| Family member received psychiatric treatment ..      | —    | —    | —    |
| Parasuicide by family member .. ..                   | **   | —    | *    |
| Suicide by family member                             | *    | —    | ***  |
| <i>Disposal</i>                                      |      |      |      |
| To in-pt. psychiatric care ..                        | —    | —    | —    |
| To social work follow-up ..                          | **   | —    | —    |

patients (Table I). By 1970, this group was no longer at greater risk, because of the increased proportion of repeaters aged under 25 years. In 1968 the proportion of repeaters under 25 was 21 per cent; in 1969, 27 per cent and in 1970, 37 per cent. The non-repeaters did not

show this trend, the proportion of under 25 in each of the three years being respectively 35 per cent, 35 per cent and 36 per cent. The proportion of over 45s showed little variation, either by repetition or by year. The effect of this change was that by 1970 the age distribution of the repeaters was much the same as that of the non-repeaters.

Since an earlier study (Buglass and McCulloch, 1970) had indicated the problems of considering the group as a single entity if the determinants of repetition were very different from men and women, the correlates of subsequent suicidal behaviour were examined in each sex separately. The general conclusion was that male and female repeaters resembled each other more closely than before. Four of the highly discriminating items already noted—sociopathy, previous in-patient care, previous out-patient care and previous hospitalized parasuicide—discriminated repeaters and non-repeaters of both sexes in all cohorts (at least  $p < .05$ ). Drug dependence was significantly associated with repetition in five out of the six (two sexes, three years) comparisons. There was a tendency for more items to be associated with repetition in females than in males, perhaps because significance level could be more easily reached with the larger numbers in the female group. In each year the majority of items which distinguished the male repeaters were also predictive for females.\*

The question of the constancy of the characteristics of the parasuicide population was considered in another way. The patients were divided into four groups—male repeaters, male non-repeaters, female repeaters and female non-repeaters—and the proportion of each group possessing the 24 personal attributes listed in Table I in each year were noted. These proportions were then ranked and Kendall's coefficient of concordance (Siegel, 1956) for the three years was calculated. The coefficients for non-repeaters were very high (males: .96, females: .97); for repeaters the results were: males .92, females .77. Some of the most

\* The total number of personal attributes which distinguished repeaters, males and females respectively, was: 1968, 9 and 16 with eight items shared; 1969, 9 and 9—seven shared; 1970, 6 and 11—six shared.

important characteristics of each group are given in Table II.

TABLE II  
*Selected characteristics of repeaters and non-repeaters*

|                                          |    | % repeaters |      |      | % non-repeaters |      |      |
|------------------------------------------|----|-------------|------|------|-----------------|------|------|
|                                          |    | 1968        | 1969 | 1970 | 1968            | 1969 | 1970 |
| Problem with alcohol                     |    |             |      |      |                 |      |      |
| M                                        | .. | 75          | 51   | 44   | 42              | 38   | 41   |
| F                                        | .. | 21          | 17   | 27   | 9               | 8    | 11   |
| Previous in-pt. psychiatric care         |    |             |      |      |                 |      |      |
| M                                        | .. | 63          | 51   | 64   | 30              | 27   | 30   |
| F                                        | .. | 61          | 57   | 51   | 23              | 24   | 25   |
| Previous parasuicide (admitted hospital) |    |             |      |      |                 |      |      |
| M                                        | .. | 62          | 49   | 55   | 23              | 26   | 27   |
| F                                        | .. | 52          | 47   | 51   | 22              | 24   | 21   |
| Not living with a relative               |    |             |      |      |                 |      |      |
| M                                        | .. | 46          | 25   | 30   | 28              | 29   | 26   |
| F                                        | .. | 28          | 15   | 27   | 15              | 21   | 15   |
| In debt                                  |    |             |      |      |                 |      |      |
| M                                        | .. | 24          | 26   | 29   | 25              | 24   | 23   |
| F                                        | .. | 32          | 26   | 21   | 17              | 17   | 15   |
| Criminal record                          |    |             |      |      |                 |      |      |
| M                                        | .. | 52          | 47   | 48   | 41              | 35   | 38   |
| F                                        | .. | 24          | 16   | 16   | 5               | 6    | 7    |
| Sociopathy                               |    |             |      |      |                 |      |      |
| M                                        | .. | 35          | 34   | 35   | 19              | 19   | 22   |
| F                                        | .. | 25          | 14   | 20   | 5               | 5    | 9    |

Table III shows the relationship of family attributes to repetition. A family member was defined as a spouse, parent, sibling or child, or any combination of these. Information about suicidal behaviour and psychiatric treatment in relatives was obtained from the patient during his stay in the R.P.C. and may therefore be an underestimate of the extent of family pathology. Nevertheless, fifteen of the eighteen comparisons showed that repeaters more often reported relatives with experience of psychiatric treatment or suicidal behaviour. For the men the differences were not large and only once reached statistical significance; the relationship was more marked for women, where five of the nine comparisons showed a significant preponderance of disturbed behaviour in a relative.

Although it did not prove possible to relate medical seriousness of the act to repetition in 1968 or 1969, the comparison for 1970 is of some interest. Sixty-one per cent of repeaters and 64 per cent of non-repeaters were graded 0 (conscious) on the method of assessment described by Matthew and Lawson (1966). A further 19 per cent and 16 per cent respectively, were assessed as grade 1 (drowsy but responds to verbal commands). Only 5 per cent of each group were grade 4 (no response to maximum painful stimulation). The level of coma is, therefore, quite unrelated to repetition.

TABLE III  
*Repetition and family experience*

\* significant ( $P < .05$ ) difference between repeaters and non-repeaters

|                                       |    | Males  |            |        |            |        |            | Females |            |        |            |        |            |
|---------------------------------------|----|--------|------------|--------|------------|--------|------------|---------|------------|--------|------------|--------|------------|
|                                       |    | 1968   |            | 1969   |            | 1970   |            | 1968    |            | 1969   |            | 1970   |            |
|                                       |    | % rep. | % not rep. | % rep. | % not rep. | % rep. | % not rep. | % rep.  | % not rep. | % rep. | % not rep. | % rep. | % not rep. |
| <i>Presence of family member who:</i> |    |        |            |        |            |        |            |         |            |        |            |        |            |
| Received psychiatric treatment        | .. | 18     | 19         | 19     | 18         | 17     | 24         | *36     | 22         | 27     | 21         | *34    | 22         |
| Committed parasuicide                 | .. | 16     | 11         | 11     | 8          | *19    | 9          | *26     | 11         | 12     | 9          | 14     | 10         |
| Committed suicide                     | .. | 7      | 3          | 4      | 1          | 6      | 2          | *8      | 2          | —      | 3          | *12    | 2          |

*Type of treatment and repetition*

The most intensive form of therapy the clinician can recommend is in-patient care. We have already shown, however, that those admitted to in-patient care are just as likely to repeat as the remainder. The question which next arises is whether the clinician selects for admission those who possess the characteristics of potential repeaters or whether he uses quite other criteria?

Persons discharged to in-patient care were compared with those not so referred for the 24 personal attributes described earlier. Table IV shows the items associated with discharge to a psychiatric hospital in each cohort, repeaters and non-repeaters considered separately. For non-repeaters, the determinants of in-patient care are very decidedly a diagnosis of depression together with being over 45 and having received previous psychiatric treatment. The in-patients more commonly have a history of parasuicide, but this association is much less pronounced than that with diagnosis. People not living in a family setting were also more liable to be admitted to hospital. In addition, the absence of deviant behaviour (no criminal record, no debts, no problem with alcohol) is more commonly found among the in-patients.

Fewer items are related to in-patient care for the repeater group. The significant findings echo those of the non-repeaters—definable psychiatric pathology as evidenced by a diagnosis of depression, and previous treatment in combination with an absence of deviant behaviour. (Less use of alcohol, less experience of violence, less often a history of criminal behaviour or debts.)

The correlates of in-patient care are, therefore, markedly different from those of repetition. Could repetition be decreased if in-patient care were offered more widely? This question was partially tested by considering repetition among depressives and non-depressives (mostly personality disorders) separately. For depressives in each of the three cohorts, repetition is unrelated to in-patient treatment on discharge. Non-depressives, on the contrary, are more likely to repeat if they are given in-patient care (1968:  $p < .01$ ; 1969:  $p < .1$ ; 1970:  $p < .01$ ). There is no evidence, therefore, that repetition

TABLE IV

*Items associated with discharge to in-patient care*

|                                                  | Repeaters |      |      | Not repeaters |      |      |
|--------------------------------------------------|-----------|------|------|---------------|------|------|
|                                                  | 1968      | 1969 | 1970 | 1968          | 1969 | 1970 |
| Female ..                                        | —         | *    | —    | —             | *    | *    |
| 45 years+ ..                                     | —         | **   | —    | ***           | ***  | ***  |
| Separated or divorced ..                         | —         | —    | —    | —             | —    | —    |
| Social class I-IV ..                             | —         | —    | —    | —             | —    | **   |
| Depression ..                                    | —         | ***  | *    | ***           | ***  | ***  |
| Not sociopath ..                                 | —         | —    | —    | —             | *    | *    |
| No problem with alcohol ..                       | —         | —    | **   | —             | —    | *    |
| Not taken alcohol on admission ..                | **        | —    | **   | —             | ***  | ***  |
| Drug dependent ..                                | —         | —    | —    | —             | —    | —    |
| Previous in-pt. care ..                          | —         | **   | *    | ***           | ***  | ***  |
| Previous out-pt. care ..                         | —         | —    | —    | ***           | ***  | ***  |
| Previous parasuicide (hospitalized) ..           | —         | —    | —    | *             | *    | *    |
| Previous parasuicide (not hospitalized) ..       | —         | —    | —    | —             | —    | —    |
| Separated from mother when under 10 years ..     | —         | —    | —    | —             | —    | —    |
| Separated from father when under 10 years ..     | —         | —    | —    | —             | —    | —    |
| Not living with relative ..                      | —         | —    | —    | *             | ***  | ***  |
| Violence not used ..                             | —         | —    | —    | —             | —    | —    |
| Violence not received ..                         | —         | —    | **   | —             | —    | —    |
| Four or more dwelling changes in past 5 years .. | —         | —    | —    | —             | —    | —    |
| Less than 1 year at present address ..           | —         | —    | —    | —             | —    | —    |
| Not overcrowded ..                               | —         | —    | *    | —             | —    | —    |
| Unemployed ..                                    | —         | —    | —    | —             | —    | —    |
| No debts ..                                      | —         | —    | *    | —             | *    | —    |
| No criminal record ..                            | —         | *    | *    | —             | *    | ***  |

\* item associated with discharge to in-pt. care at .05 level; \*\* at .01 level; \*\*\* at .001 level of significance

is prevented by in-patient treatment. This finding is discussed later.

*Completed suicides*

The number of suicides in the year following the key admission has remained steady, repre-

senting a decrease in the proportion of annual admissions. Kessel and McCulloch (1966) report 8 suicides (1.57 per cent) in a one year follow-up of a cohort of 511 patients admitted in 1962-63. A one year follow-up of each cohort in the present study produced similar numbers; there were 8 suicides (1.94 per cent) from the 1968 cohort, 7 (1.77 per cent) from the 1969 and 8 (1.76 per cent) from the 1970 cohorts, a total of 23. As might be predicted, the suicides were somewhat older than the general parasuicide population, half (12) being 45 years or over. Two thirds of the group were female (8 men, 15 women). Six had a problem in the use of alcohol, three were diagnosed as sociopaths and 11 had one or more prior parasuicidal episodes resulting in hospital admission. Six were discharged to in-patient care. A diagnosis of depression (with or without attendant personality disorder) was given to 16 (70 per cent) of the suicides at the time of their key admission. Diagnoses made, as is inevitable at the R.P.C., after only short acquaintance with the patient are often subject to criticism. Nevertheless, this figure is substantially higher than that for the total group; of patients in the three cohorts combined, 43 per cent had a diagnosis of depression. Whereas 'illness diagnosis' was not predictive of repetition, it may perhaps indicate a greater risk of eventual death by suicide.

#### DISCUSSION

In this study we have used data from three successive annual cohorts to investigate factors which are consistently related to the repetition of suicidal behaviour. A considerable degree of consistency was found over the period examined. It is difficult to know how those items which were associated with repetition in some years but not in others should be regarded. Some variation in the parasuicide population will be accounted for by random fluctuation; since the numbers are increasing and the age structure changing, some variation in the character of the repeaters may be anticipated over time. In view of Kreitman's (1972) finding that completed suicide is increasing among the young, the increasing proportion of young repeaters is a trend which should be carefully watched. On the data available at present,

however, greater interest attaches to those characteristics which were consistently predictive of repetition in all three cohorts.

Previous psychiatric treatment, previous parasuicide, sociopathy, problems in the use of alcohol or drugs, unemployment, criminal record and low social class figured prominently. The poor prognosis carried by many of these items is supported by the findings of other studies. Kessel and McCulloch (1966), in their one year follow-up of the 1962-63 Edinburgh cohort, showed that previous parasuicide, previous psychiatric treatment and alcohol or drug problems were associated with repetition. The three-year follow-up of this cohort (Buglass and McCulloch, 1970) found that most of these items were related to repetition in either men or women. Greer and Bagley (1971), in their London study, also found anti-social personality (including alcoholism and drug dependence) and previous suicide attempts to be correlated with repetition. There is, therefore, broad agreement on the psychiatric characteristics of repeaters. They tend to be described as personality disorders who try to resolve their problems by excessive use of alcohol or drugs, who have already experienced psychiatric attention, and in whose lives parasuicide is a recurrent theme. Contrary to Greer and Bagley's finding, a diagnosis of depression was not associated with a favourable prognosis among Edinburgh parasuicides. Earlier studies in Edinburgh have shown that parasuicides in general are an under-privileged group (e.g. McCulloch and Philip, 1972). The present study demonstrates that the social characteristics of repeaters are those of a group even more markedly underprivileged and in conflict with society. In comparison with non-repeaters they are predominantly of low social class and frequently unemployed. Their past history often includes a criminal conviction; their personal relationships may be marked by violence (this trait, though usually predictive, was not substantiated in 1970 data). It is interesting that non-conflictual hardships as evidenced by overcrowding and debt are not related to repetition. As few studies have included a social description of the repeater group, it is not possible to say whether this



picture can be generalized. Bagley and Greer's (1971) finding that repeaters were more commonly drawn from Classes I-III is, however, at odds with experience here. The question of how far social class influences referral is difficult to answer. Kennedy and Kreitman (1973) studied a group of persons who were seen by their G.P. after a parasuicidal episode. For these persons, social class was unrelated to admission to the R.P.C. some time during the survey year; those in Class I and II were, however, more likely to have at least one episode of parasuicide which was treated by the G.P. at home. This suggests that Social Class I and II repeaters may be under-represented in the present work. When our data were analysed by individual social classes, Class V patients were consistently at greater risk of repetition than any other social class. Since the Kennedy and Kreitman study had shown no referral bias for classes III and IV, it is improbable that the present finding is accounted for purely in terms of selective admission of lower class patients.

Kreitman *et al.* (1969) have shown that R.P.C. patients are more likely than a matched population to have a relative who has resorted to parasuicidal behaviour. Some evidence is presented here, though at present rather tentative, that female parasuicides who have relatives who have attempted suicide are themselves particularly prone to repeat their suicidal act.

The absence of association between coma level and repetition is in line with the findings of a number of studies which have shown that the medical seriousness of the act is not related to subsequent suicidal behaviour (Kessel and McCulloch, 1966; Greer and Lee, 1967; Greer and Bagley, 1971; Cohen *et al.*, 1966), although it may be related to ultimate suicide (Rosen, 1973). It lends support to the clinical impression that all self-damaging behaviour is deserving of psychiatric attention, even if the apparent threat to life is small.

The finding that the same items are very highly associated with repetition in successive years suggests that the advance identification of repeaters is a possibility. An attempt to use this material to construct a predictive scale has had

reasonable success and is described elsewhere (Buglass and Horton, 1974).

Early identification of repeaters is a first step towards prevention, but unfortunately little practical success has as yet been achieved in devising methods towards this end. Clinicians use criteria other than the probability of repetition in referring patients for in-patient psychiatric treatment, and there is no evidence that admitting a higher proportion of patients would affect the repetition rate in any way. Too many factors are involved for any causal interpretation to be offered for the increased risk of non-depressives admitted to hospital. It is possible that the in-patient regime is not to their advantage; it is perhaps more probable that these are selected for admission because of the known intransigence of their problems. Some means of helping people who resort to parasuicide in the context of undefined psychological unrest (rather than from specific depressive symptoms) together with social deprivation is required. The concentration of repeated parasuicide in certain families and certain classes suggests a cultural component which we have not so far been able to isolate or influence.

#### SUMMARY

1. Three annual cohorts of persons admitted to the Edinburgh Regional Poisoning Centre were surveyed. Persons repeating suicidal behaviour within one year of their key admission were identified and compared with the remainder of the cohort.

2. Items which distinguished repeaters from non-repeaters in each cohort were identified. The items which consistently discriminated repeaters were: sociopathy, problems in the use of alcohol, previous in-patient psychiatric treatment, previous out-patient psychiatric treatment, previous parasuicide, Social Class V, dependence on drugs, unemployment and a history of criminal behaviour.

3. There was a considerable degree of similarity between male and female repeaters.

4. The proportion of repeaters under 25 has increased.

5. The characteristics of people discharged to in-patient care were shown to differ from those of repeaters. In-patient treatment is associated

with a diagnosis of depression and the absence of socially deviant behaviour. There is no evidence that in-patient care prevents subsequent repetition.

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# Clinical Aspects of Attempted Suicide Among Women in Trinidad and Tobago

By AGGREY W. BURKE

This paper describes the distribution of female attempted suicide and other psychiatric admissions to the twenty-bedded Psychiatric Unit of Trinidad and Tobago (population about 1 million). Reports from this area have hitherto been concerned with the socio-cultural but not the clinical aspects (McCandless, 1968; Roberts and Russell, 1969) of psychiatric disorders.

The two islands have well-developed hospital services. The psychiatric unit provides a suicide prevention programme by admitting all attempted suicide cases reaching the wards and casualty department of the General University Hospital in Port of Spain, the capital. It is estimated that about half of all reported attempted suicide cases in the country are admitted to this unit.

During the one period 1 June 1969 to 31 May 1970, there were 350 female admissions to the unit. At the end of this period the respective case notes were examined by the author for age, diagnosis and the associated acts of self-injury and self-poisoning (attempted suicide) leading to admission. For the latter cases the method used and reason given were also recorded.

Of the 350 patients 90 (26 per cent) were admitted on account of a suicide attempt, and 260 (74.3 per cent) for other psychiatric reasons. Table I shows the

age group distribution. More of those who attempted suicide were younger than 25 ( $\chi^2 = 5.65$ ,  $p < .05$ ) than those admitted for other reasons, and only a few were older than 44. The admission rate is high at 15-24 for both groups, but also at 25-44 for the non-suicide cases.

A dispute with a lover (59 per cent) or family (16 per cent) preceded the attempt in 67 cases. Twenty-three (26 per cent) either gave no reason or gave another of a personal kind. Four patients used self-injury methods (three by throwing themselves, one by cutting her wrist). Among the other 86 cases 51 (59 per cent) swallowed tablets and 35 (41 per cent) a household or garden chemical (e.g. bleach, insecticide, etc.). The method used was not associated with age group.

The psychiatrists of the unit made a formal diagnosis of mental disorder less often in attempted suicide than in the other psychiatric cases (Table II). A relative absence of schizophrenia and psychoneurosis is as noteworthy among attempted suicide cases as is the excess of affective (depressive) and personality disorders. It is of interest that formal diagnosis is associated with older cases (over 25 years) ( $\chi^2 = 10.6$ ,  $p < .01$ ). The diagnosed cases remained in care for longer periods. Two groups can therefore

TABLE I  
*Age distribution of female admissions*

|           | Psychiatric patients |       |       | Attempted suicide |      |      |
|-----------|----------------------|-------|-------|-------------------|------|------|
|           | No.                  | (%)   | Rate* | No.               | (%)  | Rate |
| 10-14     | 18                   | (7)   | 27.1  | 4                 | (4)  | 6.0  |
| 15-24     | 104                  | (40)  | 95.7  | 52                | (58) | 47.8 |
| 25-44     | 103                  | (40)  | 83.0  | 29                | (32) | 23.4 |
| 45-64     | 26                   | (10)  | 37.1  | 4                 | (4)  | 5.7  |
| 65+       | 5                    | (2)   | 21.8  | 1                 | (1)  | 4.4  |
| Not known | 4                    | (1)   | —     | —                 | —    | —    |
| All ages  | 260                  | (100) | 47.2  | 90                | (99) | 16.3 |

\* Rates calculated for admissions per 100,000 female population per annum. (*Annual Statistical Digest*, 1969).

TABLE II  
*Diagnostic distribution of female admissions*

|                         | Psychiatric patients (%) | Attempted suicide (%) |
|-------------------------|--------------------------|-----------------------|
| Affective disorder ..   | 65 (25)                  | 43 (48)               |
| Schizophrenia ..        | 72 (28)                  | 3 (3)                 |
| Psychoneurosis ..       | 48 (18)                  | 4 (5)                 |
| Personality disorder .. | 4 (2)                    | 10 (11)               |
| Organic disorder ..     | 21 (8)                   | 0 (0)                 |
| Other diagnoses ..      | 16 (6)                   | 1 (1)                 |
| All diagnoses ..        | 226 (87)                 | 61 (68)               |
| No diagnosis ..         | 34 (13)                  | 29 (32)               |
| Total ..                | 260 (100)                | 90 (100)              |



be distinguished by age, psychiatric diagnosis, method of self-poisoning and management. Both, however, give similar reasons for suicide attempts.

The population of Trinidad and Tobago is undergoing rapid social change. The estimated female attempted suicide rate (33 per 100,000 per annum) has not increased significantly during six years and is about three times greater than the male rate. Lower rates of attempted suicide by self-poisoning with household or garden chemicals in parts of Africa (Asuni, 1967) contrast with higher rates and an absence of the use of these substances in industrialized societies where tablet taking is very much more prevalent. The higher attempted suicide rate in industrialized societies suggests that this in itself is of aetiological significance. It would, therefore, be of interest to investigate the distribution of attempted suicide among West Indian immigrants in Britain.

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## Heterosexual Aversion in Homosexual Males A Second Experiment

By KURT FREUND, RON LANGEVIN and YAROSLAW ZAJAC

A substantial part of Freud's (1925, orig. 1905; 1926, orig. 1922) theorizing on the causes of male homosexuality\* was the assumption of a fear of the female genitals, and according to Radó (1969) "fear of the genitals of the opposite sex is the *basic* dynamic of the individual who wants a sexual relationship with a member of the same sex". Radó's stress on the phobic component in the causation of male homosexuality is shared by many theorists and practising clinicians.

The outcome of an earlier experiment (Freund *et al.*, 1973) did not support this theory. Androphilic† males who had been pre-aroused by pictures of male nudes did *not* respond with greater penile detumescence when presented with pictures of female nudes than when sexually neutral pictures were shown. However, there was significantly greater penile detumescence when pictures of skin diseases were exposed. Heterosexual controls, pre-aroused by female nudes and then shown male nudes, the same sexually neutral pictures and the same pictures of skin afflictions, responded analogously. The subjects also rated the impact of the pictures on a four-point scale of disgust. The homosexual subjects rated the skin affliction slides significantly more disgusting than all the other pictures, but there was no significant difference between their ratings of female nudes and of sexually neutral slides. The heterosexual subjects, on the other hand, rated the skin affliction pictures as significantly more disgusting than the male nudes, which in turn received a significantly higher rating than the sexually neutral slides.

\* Homosexuality is the sustained erotic preference for same-sexed persons, when there is a free choice as to sex and other attributes of a partner which may determine erotic attractiveness.

† Erotic preference for physically mature males.

Although homosexual males did not respond to female nudes aversively, on a verbal level or in terms of penile detumescence, the possibility had not been ruled out that they would respond aversively when confronted with the fully exposed vulva. This was the reason for replicating the above-described experiment in a modified version, namely exposing parts of the bodies of physically mature females, in particular the vulva, to androphilic males who had been pre-aroused by presentation of male nudes' pictures.

In the earlier study two kinds of sexually neutral slides had been used, landscapes and linear drawings. The latter had been responded to with greater detumescence than the landscapes, although this difference was not significant. In an attempt to make the present experiment as sensitive as possible, the line drawings were omitted. The pictures of skin diseases were also omitted in the present experiment, because it was felt that such a clearly aversive stimulus might somewhat obscure the aversive quality of less potent stimuli.

The main experiment is described in Part Two of the present report. The purpose of Part One is to show that both androphilic and heterosexual males respond with penile tumescence to isolated parts of the body of their preferred sex.

### PART ONE

#### METHOD

##### *Subjects*

An androphilic group, composed of 28 subjects, was recruited through a homophile club in Toronto. The mean age was 24.9 years, range: 18-47 years. The heterosexual group was composed of 48 subjects, two thirds of them recruited through a notice placed on a

University bulletin board, one third through a local employment agency. The mean age was 29.1 years, range: 19-54 years. Five additional subjects from both the androphilic and the heterosexual group were not included because their total response output did not reach criterion level (mean response: 650 ml.). All subjects were paid volunteers.

#### *Procedure*

The subjects were shown slides of various isolated parts of the physically mature body of their preferred sex, namely face, chest, pubic region and legs, in front view, and the rear end. Landscapes were used as sexually neutral stimuli. Each stimulus category was represented by 9 slides. In other respects, the procedure was similar to that in an earlier study (Freund *et al.*, 1973).

#### RESULTS

In comparing penile volume responses to the various stimulus categories, z-scores were derived from all the responses of each subject separately. Analysis of variance and the Newman-Keuls test were employed.

There were significant differences in responses to the various stimulus categories for heterosexual, as well as for homosexual, subjects ( $F = 107.732$ , d.f. = 5; 2,438;  $P < .001$ , and  $F = 27.541$ , d.f. = 5; 1,474,  $P < .001$ , respectively). For both groups the responses to the sexually neutral slides were significantly smaller than those to anything else. For the heterosexual group, the responses to the female pubic region were significantly larger than those to anything else; the responses to breasts and rear end were not significantly different from each other, but responses to the breasts were significantly larger than responses to the legs, whereas the responses to the rear end were not larger than the responses to the legs. For the homosexual subjects the responses to the male pubic region were significantly larger than those to everything else; there was no significant difference between responses to face, chest and rear end; the responses to the legs were significantly smaller than those to the face and rear end but did not differ significantly from those to the chest. In summary, the results indicate

that isolated parts of the body of the preferred sex do elicit differential erotic responses.

## PART TWO

### METHOD

#### *Subjects*

Twenty androphilic males (mean age: 26.9; range: 20-48 years; mean educational level reached: at least 12 grades completed but no college), recruited through a homophile club in Toronto, served as paid volunteers. Three additional subjects had to be excluded because they were not prearoused to criterion level (see below).

#### *Procedure*

The subjects were pre-aroused to 2 ml. penis volume increase with slides of male nudes, and at this point were shown either a landscape or a slide of the face, the breasts or the fully exposed vulva of a seated, physically mature female. After four trial runs this procedure was repeated 7 times for each of the four categories of stimuli, using a different picture each time. Penis volume was recorded at start of exposition of each slide ( $R_0$ ) and at the end, 20 seconds later ( $R_1$ ). Each slide was rated after  $R_1$  on a four-point scale of disgust (not at all disgusted, mildly disgusted, quite disgusted, very disgusted). Details of the procedure are identical with those reported in the 1973 study.

#### RESULTS

There were no significant differences between the various categories of potentially aversive pictures, in penis volume, at start of presentation (for  $R_0$ ,  $F < 1.0$ ). Multivariate and univariate analyses of variance and the Newman-Keuls test (Winer, 1962) were used for comparing the effect of the various categories of potentially aversive slides on penile volume changes and on verbal ratings. The volume changes ( $R_1 - R_0$ ) were evaluated in terms of z-scores derived from all the responses of each subject separately. There was a significant effect of slides in the multivariate analysis (approx.  $F = 59.821$ , d.f. = 6; 1,118,  $P < .001$ ). The effect was produced by the verbal ratings (univariate

$F = 124.063$ , d.f. = 3; 537,  $P < .001$ ). On the four-point scale of disgust, the vulva (2.45) was rated significantly more disgusting than the breasts (1.76), which in turn were rated significantly more disgusting than the face (1.21) or the sexually neutral pictures (1.09). The difference for penile volume changes ( $R_1 - R_0$ ) to the various stimuli was not significant ( $F = 2.18$ , d.f. = 3; 537,  $P > .05$ ). The correlation\* between penile volume changes and verbal ratings of disgust was significant,  $r = -.1388$ ,  $P < .001$ . However, this correlation only explains 2 per cent of the regression variance. Thus penile volume changes and disgust ratings were virtually unrelated.

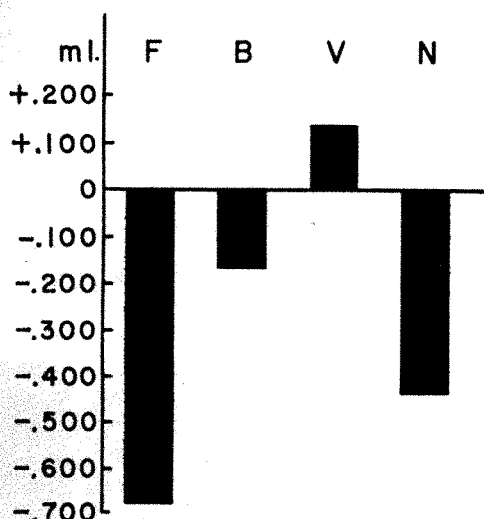


FIG.—Detumescence responses of sexually prearoused males, to stimulus slides.

Key: ml—millilitres; F—the face; B—the breasts; V—the vulva; N—landscapes.

#### DISCUSSION

The phobic theory of homosexuality only makes sense if homosexual males show an aversion to females and heterosexual males do not show an aversion to males. Penile responses in the present and earlier studies do not support the phobic theory. Neither homosexual nor heterosexual males showed significant penile detumescence to the non-preferred sex. Verbal ratings indicated the homosexual males were

\* The correlation was derived from the variance-covariance matrix of the within-subject error term in the multivariate analysis of variance.

not disgusted by the sight of full figures of female nudes, but were disgusted by the fully exposed vulva. This latter result seems to support the phobic theory, but the heterosexual subjects finding even full figures of male nudes disgusting, argues against the theory.

In the earlier study there was concordance between verbal reports and penile responses to pictures of skin diseases. The verbally expressed disgust to pictures of the vulva was not accompanied by corresponding penile detumescence, and there was a similar but less pronounced discrepancy between verbal and penile responses to pictures of the breasts. The present result and that of the 1973 study suggest that for androphilic males generally the female body does not appear to be a phobic stimulus.

#### SUMMARY

Part One of the study showed that homosexual and heterosexual males respond with penile tumescence to pictures of isolated parts of the body of their preferred sex. In Part Two, homosexual males who had been pre-aroused by pictures of male nudes did not respond to pictures of the vulva, the face or the breasts of the mature female with penile volume changes different from those in response to sexually neutral slides. However, in terms of ratings on a four-point scale for disgust, the vulva was rated significantly more disgusting than the breasts, which in turn were rated significantly more disgusting than the face and the sexually neutral pictures.

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## Differential Effects of Psychotherapy and Behavioural Techniques in a Case of Acute Obsessive Compulsive Disorder

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The current status of the psychotherapy of obsessive-compulsive conditions is somewhat confusing. For many years the condition has been regarded as resistant to psychotherapeutic intervention, but recently some success has been claimed by both behaviour therapists (for example Boulougouris *et al.*, 1971; Rackensperger and Feinberg, 1972) and psychodynamic therapists (for example Barnett, 1972; Suess, 1972). The confusion arises because despite the plethora of published work we seem little closer to an understanding of why the techniques have worked.

While some therapists of both persuasions have presented evidence to suggest that their successes are total, others, such as Stern (1970), point out that there are limitations to the effectiveness of treatments. Stern treated a long-standing case by thought-stopping and achieved a specific improvement, noting, however, that his patient remained an obsessive personality in general. The picture is further complicated by the tendency of behaviour therapists to oversimplify their descriptions of therapeutic success, and by their apparent unwillingness to venture into hypothetical realms in search of explanatory constructs. There is a tendency too, for psychodynamic therapists to state only in general terms how their methods work (for example, getting the patient to recognize that his defences such as isolation or intellectualization are inappropriate) and to offer little in the form of concrete evidence or case material to show how these general effects were achieved in individual patients.

What is needed at this stage in the development of psychotherapy research on obsessive-compulsive disorders is an understanding of the effective limits of the various alternatives; and

when and to whom they can best be applied. Such a programme for psychotherapy in general has been recently advocated by London (1972).

In this paper the treatment of an acute obsessive-compulsive episode in a young woman is described. The aim of the presentation is to show how a number of methods drawn from both the psychodynamic and the behavioural fields were considered and used to alleviate a disabling condition in a patient who herself placed many restrictions on the mode of treatment applied.

### METHOD

#### *Subject*

S was a 20-year-old female undergraduate student. At interview she was highly distressed and tearful, and constantly repeated the lines of a prayer to herself. It appeared that two days previously she had for the first time attempted intercourse with her boy friend and that she had since then experienced feelings of guilt and recurrent thoughts of being 'dirty', 'sinful' and so on. This had been followed by compulsive ritualistic repetition of a prayer. Her boy friend described her as being a withdrawn person with a deeply religious background. The subject wanted immediate help, but refused to take any kind of medication, arguing that she was afraid that if she did she would 'lose her mind'. She felt that only by repeating the prayer was she safe from losing control.

#### *Procedure*

It was at once apparent that no form of psychodynamic intervention would alleviate her condition, since attempts to relate the symptoms to sexual guilt were intellectually accepted by the patient but had no effect on

her ritual. As a consequence and given the many studies of the successful use of behavioural methods in the treatment of these disorders (Cautela, 1970; Yamagami, 1971) the following techniques were considered: thought stopping, covert reinforcement, systematic desensitization, and flooding. In view of the urgency of the case, and of the patient's poor co-operation, systematic desensitization was rejected (Furst and Cooper, 1970), and treatment began with an attempt at imaginal flooding as described by Boulougouris and Bassiakos (1973) and Rainey (1972). In this the subject was asked to stop the ritual and encouraged to experience the fear of losing control in the presence of the therapist, it being presumed that the effect of nothing untoward happening would be to enable her gradually to progressively abandon the ritual as new learning inhibited the old fear.

The second procedure, thought stopping, was introduced after a short break. S was asked to verbalize her ritual, and after a short period of time the therapist shouted 'stop!' loudly. Theoretically this is assumed to inhibit the occurrence of the behaviour, and normally after practice is used by the patient to control her own actions.

The third procedure, covert reinforcement, consisted of asking the patient to produce at least one thought that always had an immediate pleasure reaction associated with it. This turned out to be thinking of a rural scene. S was then asked to introduce this thought the moment that the first word of the prayer came into her head. Immediately the thought was successfully experienced she was instructed to say, 'I am happy', out loud. The principle involved here, as described by Cautela (1970) assumes that the functional relationship between reinforcing stimuli (thinking of a pleasant scene) and behaviour in imagination is analogous to that obtaining in reality, and inhibition occurs as in systematic desensitization.

Procedures were administered in no planned order and were alternated with brief rest periods.

#### RESULTS AND DISCUSSION

##### *Flooding*

S was unable to proceed beyond ten minutes, complaining that the technique only increased

her discomfort and her desire to repeat the ritual more frequently. It was continued and S rested for a brief

##### *Thought stopping*

This also proved ineffective. The patient felt that what was happening was too external and irrelevant and had little effect on her ritual, save for the second that 'stop!' was shouted. She requested that the technique be discontinued.

##### *Covert reinforcement*

The effects here were considerable, the patient reporting an immediate lessening of the desire to repeat the prayer. Further, she reported that this had more 'meaning' to her, as she felt that she was directly involved in the treatment. S practised this technique for a period of one hour and then went home, feeling able to control the ritual. The following day she was able to begin looking at the whole incident more coherently. She then embarked on short term psychotherapy designed to help her understand what had happened and adjust to the new demands that her present situation made on her. By this time the incidence of prayer-saying had greatly diminished, and at follow-up seven months later had not recurred. Psychotherapy was reality-orientated and non-analytic, drawing mainly on the patient's new behaviour and experiences as a basis for explaining the episode.

The effectiveness of a specific behavioural technique, covert reinforcement, in the acute phase and reality-orientated psychotherapy in the remitting phase seems best explained in terms of the particular needs of the patient. She was obsessed with the fear of losing her self-control and allowing her self-denigrating ideas to overwhelm her, and had used a covert reinforcement technique of her own, prayer saying, to establish some rudiment of control. This ritual, however, was too weak and did little more than contain the flood. Consequently a more powerful ritualistic reinforcer was indicated. The covert reinforcement used succeeded because it strengthened and developed an already existing mechanism. Psychotherapy, thought stopping and flooding actually served

negative purposes during the acute phase because they bore no relationship to her obsessional needs and her level of functioning.

Psychotherapy during remission was able to strengthen the self-control established in the acute phase, and less concrete cognitions developed about the need to maintain control. Again, however, psychodynamic formulations had to remain close to her current level of functioning. Thus, no attempt was made to question the values of her background and to delve into her familial structure; instead she was given information about sexual functioning, together with encouragement (but not interpretation) for insights developed about her own sexuality and relationships with males. She was allowed, as it were, to set her own goals and pace of progress.

#### CONCLUSIONS

The development of effective programmes for the treatment of obsessive compulsive disorders seems to require an epistemology similar to that outlined by Lazarus (1973). Lazarus argued that therapists should be familiar with a number of possible techniques in order to cope with the multimodal and idiosyncratic functioning of unique patients.

The case study brings out the importance of matching techniques with the present situational needs of the patient.

#### SUMMARY

In this case study the effects of a number of behavioural methods together with psychotherapy were evaluated in the treatment of an acute obsessive-compulsive condition. The

results suggested that covert reinforcement may have some advantages over other techniques in the acute phase, since it allows the patient to develop self-control over the impulses that create the acute condition. Psychotherapy was found to be effective only at a later stage in treatment.

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# The Sensitivity of the Beck Depression Inventory to Changes of Symptomatology

By D. A. W. JOHNSON and B. B. HEATHER

Despite the popularity of the Beck Depression Inventory (Beck *et al.*, 1961), only Salkind (1969) has attempted to validate this instrument for a general practice population. For some purposes, particularly clinical research, measurement of change in a depressive mood is more important than an absolute measure. So far only Little and McPhail (1973) have considered this aspect of use.

As part of a larger survey into depression seen in general practice, 73 consecutive patients presenting to their doctor with a new episode of depressive illness were interviewed on three separate occasions—within 7 days, 4-6 weeks later, and after 16-18 weeks (Johnson, 1973). At each interview a clinical rating was made of the patients illness and a Beck De-

pression Inventory (B.D.I.) completed; at the second and third interviews a symptom change rating (five-point scale) was recorded.

## RESULTS

Table I shows means and standard deviations of B.D.I. scores at three separate interviews. Although these scores suggest that changes in B.D.I. scores for each clinical rating do occur, it is not possible to assess the statistical significance of these changes from these data. For this reason all possible combinations of rating from one interview to the next were analysed separately and tested for statistical significance (Wilcoxon, Matched Pairs, Signed-Ranks test, all tests are one-tailed). Tables II and III give the results

TABLE I

*Means and standard deviations of B.D.I. scores for three ratings of depression at three interviews*

|                   | Moderate |      |    | Mild |      |    | None |      |    |
|-------------------|----------|------|----|------|------|----|------|------|----|
|                   | Mean     | S.D. | N  | Mean | S.D. | N  | Mean | S.D. | N  |
| Initial .. ..     | 23.7     | 5.7  | 36 | 15.9 | 6.1  | 37 | —    | —    | 0  |
| 4-6 weeks .. ..   | 21.2     | 5.4  | 13 | 11.2 | 6.2  | 30 | 2.9  | 3.6  | 30 |
| 16-18 weeks .. .. | 19.1     | 3.4  | 9  | 16.8 | 3.9  | 11 | 0.6  | 1.2  | 51 |
| Overall .. ..     | 22.4     | 5.6  | 58 | 14.5 | 6.4  | 78 | 1.5  | 2.6  | 81 |

TABLE II

*Means and standard deviations of B.D.I. difference scores for all possible pairs of clinical rating from initial to second interview*

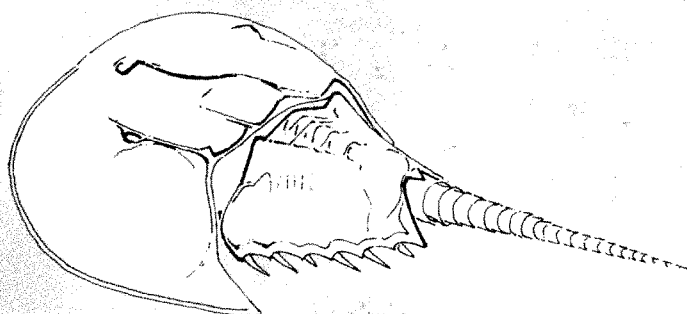
|                          | Mod-Mod | Mild-Mild | Mod-Mild | Mild-None | Mod-None |
|--------------------------|---------|-----------|----------|-----------|----------|
| Mean difference .. ..    | 3.3     | 5.0       | 11.7     | 12.0      | 20.5     |
| S.D. of difference .. .. | 5.5     | 5.4       | 7.3      | 3.3       | 5.7      |
| N = .. ..                | 13      | 18        | 12       | 19        | 11       |
| P .. ..                  | N.S.    | < .005    | < .001   | < .001    | < .001   |

TABLE III

*Means and standard deviations of B.D.I. difference scores for all possible pairs of clinical rating from second to third interview*

|                          | Mod-Mod | Mild-Mild | None-None | Mild-None | Mod-None |
|--------------------------|---------|-----------|-----------|-----------|----------|
| Mean difference .. ..    | 1.0     | -1.5      | 2.6       | 8.8       | 18.5     |
| S.D. of difference .. .. | 3.1     | 3.4       | 3.4       | 4.7       | 5.0      |
| N = .. ..                | 8       | 11        | 29        | 18        | 4        |
| P .. ..                  | N.S.    | N.S.      | < .001    | < .001    | N.S.     |

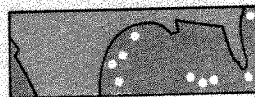
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of these analyses for initial to second, and for second to third interviews, respectively. These data are summarized as frequencies in Table IV, where only

TABLE IV  
*Relationship between changes in clinical rating and B.D.I. scores over both interview occasions*

|               |      | Clinical rating |      |          |
|---------------|------|-----------------|------|----------|
|               |      | Worse           | Same | Improved |
| B.D.I. scores | Up   | 1               | 21   | 0        |
|               | Same | 0               | 12   | 0        |
|               | Down | 0               | 46   | 62       |

the direction of change in the B.D.I. scores is considered and changes in clinical rating are simplified to three classes irrespective of interview occasion.

Table V shows means and standard deviations of differences in B.D.I. scores for five ratings of symptom change recorded at two interview occasions. The B.D.I. differences here are differences between scores at the interview shown and the initial score. The relationship between rating of symptom change and B.D.I. score change is highly significant in both cases (Kruskal-Wallis, One-Way Analysis of Variance by Ranks,  $p < .001$  one tailed). Taking each rating of symptom change separately for each interview occasion, B.D.I. scores show a significant decrease from the initial interview for all those ratings representing improvement (Wilcoxon, Matched Pairs, Signed-Ranks test,  $p < .05$ , one tailed). The small sample for the 'Worse' category does not allow an adequate test of score change.

#### DISCUSSION

It will be seen from Tables II and III that, with the exception of one combination where N was too

small, all combinations showing an improvement in clinical rating were accompanied by significant decreases in B.D.I. score. Table IV shows that a change in clinical rating was always accompanied by an appropriate change in the B.D.I. score.

In considering change in category of clinical rating, if we take the following B.D.I. score decreases: No change = 5 or below, one category = 6 to 15, two categories = 16 or above, then 80 per cent of our observations are correctly classified. There is a significant tendency overall for B.D.I. scores to decrease when the clinical rating remains constant (sign-test,  $p < .01$ , one tailed). The majority of these patients whose scores decrease (62 per cent) go on to show an improvement in their clinical rating at the next interview. Thus there is strong evidence to suggest that the B.D.I. is sensitive to improvements of symptomatology which do not warrant a change of clinical rating. The analysis of symptom change ratings (Table V) shows a relationship between symptom improvement and B.D.I. score decrease which is roughly linear (improved = decrease of 8 points, much improved = decrease of 12 points, and symptom free = decrease of 16 points).

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TABLE V  
*The relationship of B.D.I. difference scores to ratings of symptom change*

|       |    | Worse |       | No change |      | Improved |       | Much improved |       | Symptom free |       |
|-------|----|-------|-------|-----------|------|----------|-------|---------------|-------|--------------|-------|
| Weeks | .. | 4-6   | 16-18 | 4-6       | 16-8 | 4-6      | 16-18 | 4-6           | 16-18 | 4-6          | 16-18 |
| Mean  | .. | -2.0  | 3.5   | 1.1       | 1.0  | 7.6      | 8.4   | 12.3          | 12.0  | 16.4         | 17.8  |
| S.D.  | .. | 0.0   | 7.4   | 3.9       | 2.7  | 6.3      | 5.4   | 5.5           | 5.4   | 3.8          | 6.8   |
| N     | .. | 2     | 4     | 14        | 8    | 14       | 5     | 25            | 5     | 18           | 49    |

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## A Study of the Use of Antidepressant Medication in General Practice

By D. A. W. JOHNSON

Several surveys (Carstairs and Bruhn, 1962; Shepherd *et al.*, 1966; and Johnson, 1973a) have demonstrated that the treatment of psychiatric disorders in general practice consists principally of prescribing drugs, with relatively little use of social agencies and psychotherapy. Although Shepherd *et al.* (1966) comment that the treatment is often haphazard and inadequate, the published surveys of general practice give little specific information about the prescribing habits of doctors. The present author surveyed the prescribing habits of general practitioners in the treatment of depression in the belief that it is necessary to have this information in order to evaluate the need for education in this clinical expertise, and also to act as a comparison for other surveys which will undoubtedly be carried out in the future to test the effectiveness of the current expansion of undergraduate teaching in psychiatry.

### METHOD

Three separate groups of patients were investigated. Each patient had been diagnosed by their family doctor as suffering from depression. Groups A and B include any patient who presented with a sustained depression of mood, or had been diagnosed by the family doctor as suffering from a depressive illness, providing the diagnosis of primary affective illness was confirmed by the author (80 per cent), and that the patient scored more than 11 on Beck's Depression Inventory. Further details concerning the severity of depression and change in rating scale scores are published elsewhere (Johnson and Heather, 1974). The specific criteria for diagnosis of depression in Group C are unknown beyond that all patients were referred to the hospital out-patient department with a diagnosis of depressive illness.

*Group A.* One hundred and twelve consecutive patients diagnosed as suffering from a new episode of depressive illness—that is, those who had been free of all symptoms and had had no treatment for at least a year—and attending one of five practices (14 doctors). A detailed analysis of the patients, and doctor-patient relationship, the treatments prescribed and the success of the management regime of the first 73 of these patients has already been published (Johnson, 1973a).

*Group B.* Eighty-two consecutive patients who had been attending their general practitioner's surgery for treatment for a continuous period of more than three months. The patients were attending one of six practices (17 doctors).

*Group C.* One hundred and sixty-seven patients referred by seventy-three different general practitioners to the new patient clinic at two Manchester hospitals.

In the case of groups A and B the patients were interviewed at home within seven days of their consultation. All of group A were revisited after one month and again after three months. Group C were interviewed at the hospital on the day of their initial attendance. In all cases a relative was also interviewed. In groups A and B the general practitioners' records were examined, and in group C the referring doctor's letter was seen. At each interview the medication was identified and a tablet count carried out. In the hospital sample this required a second interview in some cases. The problem of drug defaulting was discussed with each patient. The date of registration by the patient with his present family doctor was noted. Each patient was asked to rate, on a four point scale, how well his family doctor knew him. This rating took into consideration not only the direct

personal contact of the patient with his doctor, but also the total family contact.

A number of general practitioners were selected randomly at post-graduate meetings to answer questions about the source of their knowledge on psychotropic drugs, and the doses they prescribed. Two psychiatric and two non-psychiatric meetings were chosen.

Shepherd *et al.* (1966) tried and failed to obtain a random sample of doctors for their survey of minor mental illness in general practice in London, and they concluded that such a sample was impracticable. The doctors chosen for this survey were all held in high esteem by their colleagues, ran well-organized practices including the use of ancillary staff, and seemed to be representative of general practitioners.

#### RESULTS

During the period under observation, 4 per cent of all patients seen in the surgeries were thought to be suffering from depression. The ratio of old cases to new cases was 2.75 to 1.

Table I shows the duration of registration with the family doctor. Half the total patients had been registered with their doctor for five years or less, and only a quarter for ten years or more. The group of patients who continued to attend their own doctor for treatment after three months (group B), had been registered with their doctor for an above average period of time compared to the other two groups (A and C).

Table II demonstrates that only one third of patients regarded themselves as well known to their family doctor. Indeed, two fifths of patients thought they were 'hardly known' or 'totally unknown' to their family doctor. It

TABLE I  
*Duration registered with general practitioners—percentages*

|                    | New patients<br>Group A<br>N = 112 | Follow-up patients<br>Group B<br>N = 82 | Patients in O.P.D.<br>Group C<br>N = 167 |
|--------------------|------------------------------------|-----------------------------------------|------------------------------------------|
| Less than 5 years  | 49                                 | 16                                      | 60                                       |
| 5-10 years         | 25                                 | 30                                      | 25                                       |
| More than 10 years | 26                                 | 54                                      | 15                                       |

TABLE II  
*Rating of relationship with G.P. prior to illness—percentages*

|              | New patients<br>Group A<br>N = 112 | Follow-up patients<br>Group B<br>N = 82 | Patients in O.P.D.<br>Group C<br>N = 167 |
|--------------|------------------------------------|-----------------------------------------|------------------------------------------|
| Well known   | 15                                 | 69                                      | 23                                       |
| Known        | 33                                 | 17                                      | 35                                       |
| Hardly known | 22                                 | 9                                       | 20                                       |
| Not known    | 30                                 | 5                                       | 22                                       |

must be remembered that this reflects not only their own relationship with the doctor but also that of the whole family. There is a highly significant trend for the patients who continued to attend their doctor for more than three months (group B) to have been better known to their doctor before the current illness than the other two groups.

Table III shows the various drugs used in the treatment of depression, and in the case of the tricyclic drugs the various doses prescribed. In all groups the tricyclic antidepressant drugs were the most popular; 61 per cent of all patients received one of this group of drugs. The proportion of patients who received a tricyclic drug at their initial consultation (92 per cent) is significantly higher than at subsequent consultations (53 per cent and 47 per cent). Fifty-six per cent of patients prescribed tricyclic drugs received 75 mgm. or more per day, but 29 per cent of patients were prescribed 30 mgm. or less per day. The daily dosage prescribed at the initial consultation (group A) is higher than that at subsequent consultations (groups B and C). The next largest group of drugs used were the minor tranquillizers, 16 per cent of all patients. Six per cent of patients received this group of drugs as their only treatment at the initial consultation compared to 20 per cent in the other groups. The phenothiazines were the only other important group of drugs used. Again their use was higher in groups B and C (9 per cent) than at the first consultation (1 per cent). The monoamine group of antidepressants were never used as the drug of first choice, and only represented 3 per cent of all drugs prescribed.



TABLE III  
*Drugs used in the treatment of depression in general practice—percentages*

|                                   | New patients<br>Group A<br>N = 112 | Follow-up patients<br>Group B<br>N = 82 | Patients in O.P.D.<br>Group C<br>N = 167 | All patients<br>N = 361 |
|-----------------------------------|------------------------------------|-----------------------------------------|------------------------------------------|-------------------------|
| Patients prescribed drugs .. .. . | 98                                 | 100                                     | 93                                       | —                       |
| Drugs unknown .. .. .             | —                                  | —                                       | 17                                       | 8                       |
| Tricyclic drugs .. .. .           | 92                                 | 53                                      | 47                                       | 61                      |
| > 75 mgm. .. .. .                 | 25                                 | 6                                       | 5                                        | 12                      |
| 75 mgm. .. .. .                   | 32                                 | 20                                      | 22                                       | 25                      |
| 30-75 mgm. .. .. .                | 15                                 | 4                                       | 6                                        | 8                       |
| 30 mgm. or less .. .. .           | 20                                 | 23                                      | 4                                        | 13                      |
| Dose unknown .. .. .              | —                                  | —                                       | 10                                       | 3                       |
| MAOI drugs .. .. .                | 0                                  | 2                                       | 4                                        | 3                       |
| Minor tranquillizers .. .. .      | 7                                  | 34                                      | 13                                       | 16                      |
| Major tranquillizers .. .. .      | 1                                  | 6                                       | 10                                       | 7                       |
| Barbiturates .. .. .              | 0                                  | 0                                       | 1                                        | < 1                     |
| Other drugs .. .. .               | 7                                  | 5                                       | 0                                        | 3                       |

All tricyclic drugs shown in doses equivalent to Imipramine.

Two fifths of patients who continued with treatment for more than three months were no longer having individual consultations with their general practitioner, but received their repeat prescriptions without an interview. Most of the patients still actually seeing a doctor made arrangements to see the same doctor within a practice partnership, but only one third of patients said that they would insist upon this procedure.

Drug defaulting remained a major problem in all groups. By the time of the second interview (one month), 65 per cent of new patients had ceased to take their medication regularly; 46 per cent of group B and 54 per cent of group C were not taking the dose prescribed. It must be remembered that the method used to evaluate drug defaulting in this survey is likely to minimize the problem.

Three principal reasons emerged for patients discontinuing their medication.

(a) Side-effects. The experience of side-effects by a patient with any particular drug did not have a simple relationship with the dose taken.

(b) The patient's attitude to the use of drugs, particularly to their use in the treatment of psychological illness. These patients formed two major groups, those who experienced guilt in

relying on drugs, and those who had a genuine fear of a future dependence on some form of medication.

(c) A lack of communication between the prescribing doctor and patient, so that the patient was sometimes unaware of the correct dosage or the need for continuing medication, and sometimes had incorrect expectations.

It was significant that problems of memory were only important with minor irregularities and were not amongst the major forms of drug defaulting.

Of the 73 general practitioners questioned as to the maximum dose of tricyclic drugs that they would use, only 21 replied that they would use 100 mg. daily or more as a daily dose in general practice. The almost universal reason given for not using a higher dose was the problem of side-effects. When the same doctors were asked their primary source of information on the use of drugs in psychiatric cases, 19 said from the drug firms, 15 from a medical source (meetings, books or journals) and 39 stated from a variety of sources.

Table IV shows the use of hospital specialist services. In group A 7 per cent of patients were referred to the out-patients clinic in the three month period, but only half saw a psychiatrist and the other half saw a non-psychiatric

TABLE IV  
*Use of specialized services—patients*

|                           | New<br>patients<br>Group A<br>N = 112 | Follow-up<br>patients<br>Group B<br>N = 82 |
|---------------------------|---------------------------------------|--------------------------------------------|
| Psychiatric O.P.D. . .    | 4                                     | 13                                         |
| Non-psychiatric O.P.D.    | 4                                     | 11                                         |
| Psychiatric admission . . | 4                                     | 9                                          |
| Non-psychiatric admission | 1                                     | 0                                          |

specialist for reassurance over a somatic symptom. As might be expected, in group B a higher percentage (24 per cent) of patients had consulted a specialist, but the proportion of patients seeing a non-psychiatric specialist in the out-patient clinic remained approximately the same.

#### DISCUSSION

##### (a) *Discussion of the present study*

The findings of this survey confirm an opinion expressed in a previous paper (Johnson, 1973a) that the potential for a traditional type family doctor-patient relationship in an urban general practice is strictly limited. Because of the mobility of both doctor and patient the situation where one doctor can care for and grow to know a family over the years, and perhaps generations, no longer exists. The development of partnerships and group practices has further reduced this potential. In this survey only one third of patients thought of themselves or their families as well known to their family doctor, and half the patients had been registered with their doctor for five years or less. The modern patient is beginning to accept the doctrine of the group practice, and only one third of patients would normally insist on seeing a specific doctor within a partnership.

The advantages of the traditional family doctor-patient relationship are clearly seen when the characteristics of the patients who continue to attend their doctor for treatment of depression for three months or more are examined. Johnson (1973a) has already shown that those actually attending the doctor are only a proportion of those still in need of treatment. These patients have been registered with their doctor for a longer period, and they regarded

themselves and their families as having been better known to their family doctor before their current illness. It is also likely that a good doctor-patient relationship would have had an influence upon the rate of drug-defaulting. This fact has been previously noted by Porter (1970).

An analysis of the way in which drugs were used in the treatment of depression identifies a trend which is a matter for concern. Although tricyclic drugs were, appropriately, the commonest group of drugs used in each sample of patients, the mode of their use is difficult to understand. While it must be recognized that there is no universally accepted dose regime, most psychiatrists would agree that 75 mgm. per day is the minimum dose likely to be therapeutic, and that this dose should be increased to 150 mgm. or more, per day if the lower dose fails to produce clinical improvement. Recent research has shown that it is likely that a critical drug-plasma level has to be achieved before it is therapeutically effective. Braithwaite *et al.* (1972) have suggested that this drug-plasma level is 120 ng. per ml. and point out that in some patients this level is not achieved with a daily dosage of 150 mgm. Even if a dose lower than 75 mgm. is accepted as therapeutic it would be difficult to justify a dose as low as 30 mgm. per day.

Accepting 75 mgm. per day as a therapeutic regime, it can be seen that the proportion of patients on this treatment dose decreases with time, and amongst the patients who remain on tricyclic drugs the proportion receiving a non-therapeutic dose actually rises in those patients who fail to respond to the drug. This is not only shown in an analysis of the three groups in this present survey, but was also clearly demonstrated in the three-month follow up of group A. The argument is sometimes used that patients treated in the setting of general practice are different from hospital out-patients and require a different treatment. This viewpoint is entirely unsupported by fact. Johnson (1973a) has demonstrated that much of the depression treated in general practice is far from trivial. The same author has also shown that up to half of the patients seen in the hospital out-patients clinic have either not been



referred by their general practitioners, or have not seen their doctor prior to referral. Often the factors determining hospital referral are unrelated to the medical condition of the patient (Johnson, 1973c). Other authors (Kessel, 1963) have also demonstrated that the process of referral is complex and often unrelated to severity of the illness or need of the patient. Even if the spectrum of cases seen were in fact different there is no evidence that in the clinical response of a patient there is a direct relationship between the severity of the depression experienced and the oral dose or drug-plasma level required to promote improvement. In a substantial minority of cases the tricyclics are abandoned altogether in favour of minor tranquillizers or even major tranquillizers—a group of drugs themselves known to produce depression on occasion (Johnson, 1972)—without the tricyclics being given a proper trial.

Another worrying feature is the high proportion of patients on medication for more than three months who are given repeat prescriptions without seeing their doctor. Even if patients have been prescribed these drugs from a hospital clinic, the patients should be seen to assess progress and to monitor possible side-effects. It is in any case unlikely that drugs would produce any beneficial effect after this period of time, providing the correct dosage has been used, and alternative treatments should be under active consideration.

The very strong implication from the above analysis of the way in which drugs are used in the treatment of depression is that many general practitioners are still unaware of the correct use of psychotropic drugs. This conclusion is supported by the views expressed by the general practitioners questioned. Less than one third of the general practitioners questioned were prepared to prescribe 100 mgm. or more per day. The principal reason given for not using a higher dose was the expectation that such a dose would produce side-effects, and that the patient would then discontinue treatment. In fact this study failed to show a simple relationship between dose prescribed and the incidence of side-effects. The tolerance of patients varies considerably. This result is supported by Braithwaite *et al.* (1972), who found no correla-

tion between drug-plasma levels and side-effects.

If an attempt is to be made to correct or improve the knowledge of general practitioners in the important subject of psychopharmacology, it is essential to know the source of their knowledge. As might be expected, undergraduate teaching played almost no part in the current clinical practice of the doctors questioned. The majority identified a number of sources, but one quarter of general practitioners stated that the pharmaceutical industry's literature and representatives were their only source of information, and a number of other doctors agreed that this was an important source.

Drug defaulting was identified as a major problem in the treatment of depression, as it is in other psychiatric illnesses (Johnson and Freeman, 1973). The important feature is that the three major causes identified by patients are all likely to be reduced by a doctor who has the trust of the patient and is prepared to spend time discussing the problem. Difficulty in remembering to take a drug was of importance with minor irregularities of the treatment regime rather than with the discontinuance of a drug permanently or for an extended period. When prescribing antidepressive medication it is important to discuss specifically with the patient his attitude to the illness and its treatment by medication; one should give detailed instructions about taking the tablets, including the need to continue the medication beyond the initial supply prescribed, ideally giving a specific date for the next interview.

When the referrals to specialist services are analysed, it is interesting to note that approximately equal numbers are referred to non-psychiatric and psychiatric out-patient clinics. The usual reason for referral to a non-psychiatric clinic is to reassure the patient over some somatic symptom rather than for the exclusion of a physical illness by the doctor.

#### (b) *Discussion of this study in relation to the others in the series*

This is the fourth report on a series of surveys attempting to evaluate the treatment of psychiatric patients in the community. The first survey (Johnson, 1973b) found that psychiatrists

regarded themselves as largely responsible for the total treatment of their patients, rather than fulfilling a consultative role, even though in 65 per cent of patients the hospital did not offer any form of treatment that was not equally available in the setting of general practice. Another study (Johnson, 1973c) showed that while one third of general practitioners treated their patients energetically before referral, a slightly larger proportion were using the out-patients department as a source of primary care or advice. In an investigation of the treatment of new cases of depression in general practice (Johnson, 1973a) the results showed that the treatment prescribed deteriorated with the passage of time, so that ultimately the outcome at three months was largely uninfluenced by the treatment offered. It was stressed that the fault was not entirely the doctors', but must be shared by the present system of general practice and also by the patients themselves. This present survey again suggests that the traditional family-doctor-patient relationship is no longer operative in urban areas. It also emphasizes an apparent lack of knowledge of psychopharmacology amongst general practitioners, and illustrates not only that the use of drugs is often inappropriate but also that the drug treatment prescribed is likely to deteriorate the longer the patient attends the doctor, irrespective of clinical response.

It is difficult to accept that this lack of knowledge is an accident, or the result of a biased sample, since the practices surveyed were chosen because the doctors concerned were held in high regard by their colleagues. The intention was to discover the prescribing habits of good doctors, not of bad doctors. In any case, the sample of doctors in group C was too large (73 doctors), and the results too consistent with groups A and B, for the results to be explained away so easily. All the facts seem to indicate that even among good doctors knowledge of and interest in psychiatry is strictly limited. It is likely that the local psychiatrists are aware of this situation, and it probably influences their mode of practice. This may explain why they take over the total management of such a high proportion of referred patients. If this conclusion is correct it is most unlikely that the Manchester

area is vastly different from most other provincial centres. It would seem important to clarify this issue, since if it is true it must be acknowledged honestly and not concealed for reasons of political expediency. In the redevelopment of the Health Service, the general practitioner is still envisaged as the cornerstone of the service in general, and a key figure in the treatment of the psychiatric patient in the community. It might be more realistic to develop a comprehensive psychiatric service within the existing structure involving only those general practitioners who are trained and interested in the specialty, apart from the initial referral. This would not be such a revolutionary concept, since other specialties such as obstetrics—so recently claimed as the key to good family practice—have already reached such a conclusion. The adoption of this viewpoint should not be taken as an implied criticism of either individual doctors or of any particular group of colleagues. The practice of psychiatry, either within the hospital service or in general practice, is attractive to only a limited number of doctors. This is both understandable and desirable among such a diverse group of professional workers, since the qualities of personality and skills required are very different from those for certain other specialties.

Whatever the solution may be, it is obvious that further operational studies are required in the field of community psychiatry to evaluate the standards of practice actually carried out, rather than that there should be a blind acceptance of the standards claimed.

#### SUMMARY

An analysis of the treatments prescribed to three different groups of patients suffering from depression suggests that psychotropic drugs are often used inappropriately in general practice. This view is confirmed by the opinions expressed by a group of general practitioners who were also questioned. The reasons for drug defaulting by patients were also explored.

It is suggested that in the setting of urban general practice the potential for the traditional family-doctor-patient relationship is strictly

limited, and that in practice the interest in, and knowledge of, psychiatry and psychotropic drugs is relatively small.

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## The Economics of Rehabilitation

By A. J. CHEADLE and R. MORGAN

### INTRODUCTION

The Tunbridge Report on Rehabilitation (1972, para 71) comments on 'the paucity of research on the requirements of rehabilitation and the evaluation of rehabilitative treatment and techniques.' An unusual way of evaluating the effectiveness of rehabilitation is to study its cost.

One such study was conducted by Jones and Sidebotham (1962). They calculated the cost per case and the cost per short-stay patient week in three hospitals. It turned out that the most expensive one per week had the lowest cost per episode of illness. This study confirmed the earlier findings of Wadsworth, Tonge and Barber (1957).

Another ambitious study was the Psychiatric Evaluation Project (PEP) which examined and compared data about 12 V.A. hospitals in the U.S.A. Stumpf (1964) reported that relative effectiveness was correlated negatively with size of hospital and positively with staff-patient ratio; hence the more effective a hospital the more expensive it tended to be. Ullmann (1967) confirmed these findings.

May (1971) compared the costs of five different treatment regimes applied to first-admission schizophrenics. He found that the cheapest treatment, which was drugs alone, was also the one which produced the best clinical result.

McKenzie (1968) attempted to show the benefits both to the National Exchequer and to the individual of having adequate retraining facilities for disabled people living in the community. He estimated that a training course cost about £260. He argued that this small outlay pays for itself many times over in terms of increased individual earnings, increased tax contributions and decreased Social Security Benefits. He concluded 'We owe it both to the disabled and the community at large to spend a good deal more time and effort in establishing

an accurate cost benefit analysis of the economics of rehabilitating the disabled.'

In the light of these studies and exhortations we have attempted to analyse the economic consequences of our hospital's efforts over 10 years to rehabilitate its first 200 patients.

### *Description of the hospital*

St. Wulstan's Hospital opened in November 1961, and has been described at length by Morgan, Cushing and Manton (1965). It serves as a rehabilitation unit for long-stay patients selected and transferred from other mental hospitals in the Birmingham Region of the National Health Service. The regime is highly structured, especially on week-days, and much emphasis is placed on patients' responsibilities to the work programme, to communal ward life and to themselves. In their leisure time they are officially free to do as they choose.

The hospital has four doctors and usually about 75 nurses. The in-patient population has ranged from 180 to 235 at different times. Since 1964 there has also grown up an increasing population of day-patients whose number reached 75 at the end of 1970; these are all former in-patients now living in lodgings in the local town and commuting to sheltered work at the hospital. There is little doubt that the numbers of doctors and nurses amount to a more generous allocation than was known to any of the patients in their parent hospitals, especially as most of them came from comparatively under-staffed long-stay wards. The mean length of stay in the parent hospital before transfer was about ten years. Some patients, of course, do not do well after transfer, and the right is exercised (always reluctantly and belatedly) to return these to their parent hospital.

The cost per week of maintaining a patient in this hospital has remained considerably higher than the equivalent cost in an average

parent hospital. However the disparity in costs has narrowed considerably.

(The 1961 figure in Table I should be dis-

TABLE I  
*Weekly maintenance cost at St. Wulstan's Hospital and parent hospitals*

| Year | St.<br>Wulstan's<br>Hospital | Parent hospitals |             |              | Day-<br>patient<br>total cost |
|------|------------------------------|------------------|-------------|--------------|-------------------------------|
|      | £                            | Lowest<br>£      | Median<br>£ | Highest<br>£ | £                             |
| 1961 | (62.34)                      | 6.24             | 8.37        | 10.34        | —                             |
| 1962 | 17.21                        | 6.52             | 8.84        | 11.49        | —                             |
| 1963 | 17.54                        | 6.81             | 9.52        | 12.15        | 11.00                         |
| 1964 | 18.57                        | 7.39             | 10.53       | 13.70        | 11.00                         |
| 1965 | 20.25                        | 8.51             | 11.46       | 15.65        | 11.50                         |
| 1966 | 21.01                        | 9.58             | 12.44       | 16.82        | 11.50                         |
| 1967 | 21.55                        | 10.44            | 13.40       | 17.92        | 12.00                         |
| 1968 | 24.45                        | 11.59            | 15.23       | 19.45        | 12.50                         |
| 1969 | 25.88                        | 13.09            | 17.06       | 21.74        | 12.50                         |
| 1970 | 29.72                        | 15.57            | 20.80       | 25.91        | 12.50                         |

(Figures obtained from Regional Costing Booklet referring to financial year and adjusted to refer to calendar years.)

regarded—it is artificially high because of the very small number of patients admitted). Whereas in 1962 St. Wulstan's cost almost twice as much as the median parent hospital, by 1970 it was costing only 43 per cent more. This is presumably because over the years parent hospital patient populations have fallen and staff ratios have improved.

Community facilities were scanty in 1961 and little better in 1970. Some hostels exist, but the patients' needs have been suited better by lodgings, and our community nurses have always been able to find these. Thus the resettlement of a patient has never been prevented by the lack of somewhere to live (Payne, 1972).

No sheltered work in the community was accessible to our patients until 1967, when the Birmingham Industrial Therapy Association opened its doors to all comers. A small number of patients have been referred there on discharge.

#### METHOD OF STUDY

Our aim has been to measure the true cost to the national economy of psychiatric rehabilitation.

The first 200 consecutive admissions to the hospital appeared to form the most suitable cohort to study,

for several reasons. As the first to be admitted they could be followed up for the longest period. They were admitted in groups of 7–10 per week over a period of six months starting in November 1961 when the hospital opened; this period is so short that for certain purposes they could be considered to have been admitted all at the same time; by contrast any subsequent cohort of the same size took about three years to arrive here. Also, unlike any subsequent cohort, the first 200 patients were deliberately selected to include a wide range of chronicity and clinical deterioration; they did not include only those whose prospects appeared to be best. The choice of this cohort for the study will therefore yield an unfairly bad picture of the hospital's overall success rate. Its wide range will, however, yield prognostic data which we hope to present in a subsequent paper.

The cohort was made up as follows:

|      |       |     |
|------|-------|-----|
| Sex: | Men   | 116 |
|      | Women | 84  |

Number of previous admissions:

|    |    |
|----|----|
| 1  | 69 |
| 2  | 54 |
| 3  | 36 |
| 4  | 16 |
| 5  | 17 |
| 6+ | 8  |

Diagnosis:

|                                       |     |
|---------------------------------------|-----|
| Schizophrenia                         | 164 |
| Affective psychosis                   | 3   |
| Inadequate personality                | 9   |
| Mental subnormality                   | 7   |
| Schizophrenia and mental subnormality | 5   |
| Schizo-affective psychosis            | 5   |
| Organic psychosis                     | 7   |

Wing group (schizophrenics only) (Wing 1961):

|    |    |
|----|----|
| 1A | 36 |
| 1B | 58 |
| 1C | 40 |
| 2  | 15 |
| 3  | 7  |
| 4  | 5  |
| 5  | 3  |

Social withdrawal score (Wing, 1961):

|    |    |
|----|----|
| 0  | 71 |
| 1  | 22 |
| 2  | 25 |
| 3  | 16 |
| 4  | 19 |
| 5  | 24 |
| 6+ | 23 |

|                                                   | <i>Range</i> | <i>Mean</i> | <i>S.D.</i> |      | <i>Men</i> | <i>Women</i> |
|---------------------------------------------------|--------------|-------------|-------------|------|------------|--------------|
|                                                   |              |             |             |      | £          | £            |
| Age on first admission to mental hospital         | 16-49        | 28.4        | 7.0         | 1961 | 7.74       | 6.83         |
| Length of total stay in mental hospitals (years)  | 1-36         | 11.2        | 6.7         | 1962 | 8.24       | 7.04         |
| Length of current stay in parent hospital (years) | 1-36         | 10.2        | 7.4         | 1963 | 8.49       | 7.39         |
| Age on transfer here from parent hospital         | 22-57        | 42.0        | 7.7         | 1964 | 8.52       | 7.73         |
| IQ (WAIS full scale score)                        | 50-123       | 82.0        | 19.0        | 1965 | 9.22       | 8.09         |
|                                                   |              |             |             | 1966 | 9.92       | 8.59         |
|                                                   |              |             |             | 1967 | 10.42      | 8.83         |
|                                                   |              |             |             | 1968 | 10.87      | 9.42         |
|                                                   |              |             |             | 1969 | 12.00      | 10.75        |
|                                                   |              |             |             | 1970 | 12.92      | 11.50        |

Although a wealth of follow-up data about discharged patients was to be found in their St. Wulstan's case notes, including much information about subsequent employment, these inevitably lacked the complete detail that we required for the whole period, and they were not used. Instead we were able to obtain from the Records Department of the Social Security Division of the Department of Health and Social Security confidential and comprehensive information on the contributions and credits over the period 1961-70 of all those patients who had ever worked in open employment during those years. From this priceless information it was possible to construct in the case of each discharged patient a week by week record of the number of weeks worked (which was implied by the fact that the employee's National Insurance contribution had been paid), the number of weeks off sick (implied by the drawing of Sickness Benefit) and the number of weeks unemployed (implied by the drawing of Unemployment Benefit).

We would have liked the same accurate data on the amount of income tax paid by the sample, but after many enquiries it became obvious that we would not get them. We therefore had to resort to some kind of informed estimate. In the case of any patient in open employment we assumed a notional figure for weekly earnings. The experience of one of us (A.J.C.) of working for four years as a social worker at the hospital from 1966-69 inclusive (Cheadle, 1970) was of value here in providing first hand knowledge of the level of jobs which ex-patients did. We consulted the British Labour Statistics Historical Abstract (Department of Employment, 1969) to find the most typical and representative wage for each year for doing a job of an unskilled nature. These rates were then used as the notional earnings of all patients in open employment, as follows:

They amount deliberately to a slight underestimate of patients' earnings, and they are basic rates which take no account of overtime. We knew that none of these patients had any dependent relatives. We further assumed, and this is almost certainly true, that none of them was entitled to any allowances apart from Personal and Earned Income Allowances. The annually applicable rates of tax and allowances were obtained from the Annual Abstract of Statistics (Central Statistical Office, 1971), and each patient's tax contribution was then calculated, taking into account any periods of sickness or unemployment.

There were 57 patients who had been returned to their parent hospital and another 15 who had reached there by other routes, or were in some other hospital or institution. We obtained up-to-date information on these by writing to the hospitals concerned.

The 125 patients in the sample who were entitled to Sickness Benefit had been drawing it long enough for the weekly amount payable to have been reduced to the basic rate. This altered during the period under review as follows:

|         |        |
|---------|--------|
| 1961-65 | £0.57½ |
| 1965-70 | £0.80  |
| 1970    | £1.00  |

The exact amount to which each patient was entitled has been calculated and debited to his or her account in our study.

In February 1971, Britain changed to decimal currency, and we have therefore expressed all money in terms of this conversion. For the sake of clarity we have used the calendar year as the basis for all annual calculations, when necessary converting raw data from all the other varieties of year that are in use.

The costs of maintaining a patient in any hospital in the Region were readily obtained from the Regional Costing Booklet. For day-patients the official cost per attendance at hospital was obtained from the same source, and we assumed that they all attended

five days a week. Day-patients were also in receipt of Sickness Benefit payments or Supplementary Allowances, or both, and these were included in our costs.

All follow-up and care in the community during the relevant period were supplied by nurses employed by the hospital, acting in the role of social worker. This means that these costs have already been accounted for in the in-patients' bill. This results in a slight but inevitable over-estimate of the total cost of in-patients, but it means that there are no further hidden costs in the day-patient sector.

Using the financial ingredients already described, an individual statement of each patient's 'account' was constructed year by year for the years 1961-70 inclusive. Each statement contained a debit and a credit side. Simple addition of the annual figures yielded the ten-year cost. Subtraction of the credit figure from the debit figure gave the net cost. Addition of the individual costs of the 200 patients gave the cost of the whole cohort.

### RESULTS

By the end of 1970, 82 of the 200 patients were successfully resettled in the community, 14 were also living out of hospital but attending as day-patients, 69 had returned to their parent hospitals as failures, and only 19 still remained undergoing rehabilitation; 12 of these had been in-patients here throughout. Altogether 44 of the 200 patients were day-patients at some stage in their rehabilitation; for some of them it was a stepping stone to subsequent full discharge, for others it was the peak of their achievement. During the ten year period 109 patients (54.5 per cent of the sample) achieved full discharge, but each year a proportion relapsed and had to be readmitted. Most of those who were readmitted were later discharged a second time, and indeed in some cases a third, fourth, fifth or sixth time. At the end of 1970, there were 27 patients who had been out but were back in hospital; of the 82 who were out, 52 were people who had needed only one discharge, while the other 30 had needed more than one.

Fifty-seven patients had been discharged by the end of their second year, of whom 7 had been readmitted. It should be noted, however, that substantial proportions of the cohort were not ready for discharge until their third year (26 patients) or fourth year (14 patients) of rehabilitation. Of the 109 who were going to

achieve discharge, 97 (89 per cent) had achieved it by the end of the first four years, while only the remaining 12 achieved it during the second four years.

One patient was repatriated to Sierra Leone. Three patients died while still in-patients here. A further 12 had died between the time they left here and the end of 1970; 8 of these died in the community and 4 in their parent hospital.

We will confine ourselves to this general outline of the careers of our 200 patients. Any attempt to sort them into any more detailed categories at once comes up against the multitude of different patterns that they described, which almost dictate a separate category for each single patient.

We will accordingly express the remainder of our findings in financial terms. For convenience these are arranged according to the locations of the patients.

In Table II are collected together the annual

TABLE II  
*Costs incurred by sample at St. Wulstan's Hospital*

| Year  | In-patients   |                  | Day-patients | Total      |
|-------|---------------|------------------|--------------|------------|
|       | Hospital care | Sickness benefit | total costs  |            |
|       | £             | £                | £            | £          |
| 1961  | 6,732.72      | 53.47            | —            | 6,786.19   |
| 1962  | 195,339.16    | 3,019.33         | —            | 198,358.49 |
| 1963  | 138,653.70    | 3,333.82         | 110.00       | 142,097.52 |
| 1964  | 106,127.55    | 2,471.18         | 1,408.00     | 110,006.73 |
| 1965  | 76,585.50     | 2,014.40         | 3,726.00     | 82,325.90  |
| 1966  | 60,760.92     | 1,588.80         | 5,681.00     | 68,030.72  |
| 1967  | 50,513.20     | 1,327.20         | 4,632.00     | 56,472.40  |
| 1968  | 44,401.20     | 1,217.70         | 4,687.50     | 50,306.40  |
| 1969  | 32,142.96     | 891.00           | 7,500.00     | 40,533.96  |
| 1970  | 31,414.04     | 814.00           | 7,787.50     | 40,015.54  |
| Total | 742,670.95    | 16,730.90        | 35,532.00    | 794,933.85 |

costs of members of the sample while they were in-patients or day-patients of this hospital. The bill covers a period of 9 years and 5 weeks and amounts to £794,934.

Similarly in Table III are collected together the annual costs of members of the sample while they were in-patients in their parent hospital (or other hospital). Our decision to begin the ten-year survey period at the beginning of 1961



TABLE III  
Costs incurred by sample in parent and other hospitals

| Year  | In-patients      |                     | Day-patients<br>total<br>costs | Total      |
|-------|------------------|---------------------|--------------------------------|------------|
|       | Hospital<br>care | Sickness<br>benefit |                                |            |
|       | £                | £                   | £                              | £          |
| 1961  | 85,351.88        | 3,684.02            | —                              | 89,035.90  |
| 1962  | 15,074.34        | 569.25              | —                              | 15,643.59  |
| 1963  | 3,754.33         | 145.80              | —                              | 3,900.13   |
| 1964  | 10,627.92        | 432.00              | —                              | 11,059.92  |
| 1965  | 23,283.28        | 956.00              | —                              | 24,239.28  |
| 1966  | 29,958.73        | 1,152.00            | 92.00                          | 31,202.73  |
| 1967  | 40,089.21        | 1,326.40            | 1,164.00                       | 42,579.61  |
| 1968  | 45,180.62        | 1,540.80            | 1,950.00                       | 48,671.42  |
| 1969  | 52,506.33        | 1,577.70            | 2,675.00                       | 56,759.03  |
| 1970  | 65,267.69        | 1,796.00            | 3,050.00                       | 70,113.69  |
| Total | 371,094.33       | 13,179.97           | 8,931.00                       | 393,205.30 |

means that all the sample numbers are costed to their parent hospitals for a period of 11-17 months up to the time of their transfer to this rehabilitation hospital. Thereafter parent hospital costs are incurred only by those patients who were returned to their parent hospital as failures. The total amounts to £393,205.

Table IV lists the annual costs incurred by ex-patients in the community. Here are included the costs of periods of unemployment or

TABLE IV  
Costs incurred by ex-patients unemployed in the community

| Year  | Cost |            |
|-------|------|------------|
|       |      | £          |
| 1961  | ..   | —          |
| 1962  | ..   | 1,266.00   |
| 1963  | ..   | 6,036.00   |
| 1964  | ..   | 7,848.00   |
| 1965  | ..   | 9,932.00   |
| 1966  | ..   | 10,543.00  |
| 1967  | ..   | 12,467.00  |
| 1968  | ..   | 17,040.00  |
| 1969  | ..   | 16,897.50  |
| 1970  | ..   | 19,567.50  |
| Total | ..   | 101,597.00 |

sickness suffered by any of the discharged patients. They amount to £101,597.

By contrast, Table V shows the annual contributions to the national economy of the discharged patients at times when they were in work and therefore contributing. These amount in total to £20,825. The fact that the costs amount to five times as much as the contributions, may mislead the reader into thinking that the majority of ex-patients had achieved and been granted their discharge to no better purpose than to spend their lives in the community

TABLE V  
Contributions made by patients employed in the community

| Year  | Income tax  |             | N.H.I.      |             | Graduated pensions |             | Total     |
|-------|-------------|-------------|-------------|-------------|--------------------|-------------|-----------|
|       | In-patients | Ex-patients | In-patients | Ex-patients | In-patients        | Ex-patients |           |
|       | £           | £           | £           | £           | £                  | £           |           |
| 1962  | ..          | 18.26       |             | 78.45       |                    |             | 96.71     |
| 1963  | ..          | 104.91      | 112.62      | 487.86      |                    |             | 705.39    |
| 1964  | ..          | 374.79      | 129.72      | 1,098.02    |                    |             | 1,602.53  |
| 1965  | ..          | 34.70       | 814.01      | 1,584.52    | 2.56               | 14.87       | 2,635.41  |
| 1966  | ..          | 66.45       | 1,029.82    | 140.15      | 4.71               | 65.08       | 3,019.62  |
| 1967  | ..          | 75.20       | 1,142.40    | 114.53      | 7.26               | 91.32       | 2,987.58  |
| 1968  | ..          | 5.05        | 942.14      | 8.22        | 0.75               | 131.20      | 2,806.58  |
| 1969  | ..          |             | 1,568.57    | 1,889.55    |                    | 259.47      | 3,717.59  |
| 1970  | ..          |             | 1,262.16    | 1,659.09    |                    | 329.07      | 3,253.84  |
| Total | ..          | 181.40      | 7,257.06    | 693.51      | 15.28              | 891.01      | 20,825.25 |

either idle or sick. This was not so. It is rather that the direct costs of unemployment or sickness are high, while the direct financial contributions resulting from employment are comparatively low. (We make no attempt to compute the indirect costs or contributions in the manner essayed by Rashi Fein (1958). In fact, out of 31,878 patient-weeks lived in the community by members of our sample, 14,590 patient-weeks were spent in unemployment or sickness while 17,288 patient-weeks were occupied in open employment.

Table VI summarizes the totals of Tables

TABLE VI  
*Summary of costs incurred and contributions made by patients*

|                                                                      | £            |
|----------------------------------------------------------------------|--------------|
| Total costs incurred at St. Wulstan's Hospital (from Table II) .. .. | 794,933.85   |
| Total costs incurred in parent hospitals (from Table III) .. ..      | 393,205.30   |
| Total costs incurred in the community (from Table IV) .. ..          | 101,597.00   |
| Total gross costs .. ..                                              | 1,289,736.15 |
| Less contributions made by patients (from Table V) .. ..             | 20,825.25    |
| Total net costs .. ..                                                | 1,268,910.90 |

II-V and shows that the net direct costs to the national economy incurred by the 200 patients over 10 years was a little over £1½ million. This represents approximately £634 per patient per year or a little over £12 per patient per week.

Such average figures would mean little enough anyway, but they mean even less from the fact that they relate to a period of cost-inflation during which the value of the £ was depreciating annually. The rate at which it did so is shown in Table VII, which also contains the annual net costs of the sample, both in raw form and adjusted in terms of the 1961 value of the £. These costs have fallen consistently year after year but most spectacularly in the first 4-5 years.

The cheapest patient cost £497 net; she was admitted in March 1962, was discharged in June 1962 and has remained out of hospital and in open employment ever since (the major part

TABLE VII  
*Annual net costs of the 200 patient sample*

| Year  | Net cost<br>£ | Conversion<br>factor to<br>obtain<br>constant<br>value of £* | Net cost<br>at 1961<br>value of £ |
|-------|---------------|--------------------------------------------------------------|-----------------------------------|
| 1961  | 95,822        | 1.00                                                         | 95,822                            |
| 1962  | 215,171       | 0.96                                                         | 206,564                           |
| 1963  | 151,328       | 0.94                                                         | 142,248                           |
| 1964  | 127,312       | 0.92                                                         | 117,127                           |
| 1965  | 113,862       | 0.88                                                         | 100,199                           |
| 1966  | 106,757       | 0.84                                                         | 89,676                            |
| 1967  | 108,531       | 0.82                                                         | 88,995                            |
| 1968  | 113,211       | 0.78                                                         | 88,305                            |
| 1969  | 110,473       | 0.74                                                         | 81,749                            |
| 1970  | 126,443       | 0.71                                                         | 89,775                            |
| Total | 1,268,910     |                                                              | 1,100,460                         |

\* Obtained from *Whitaker's Almanack* for 1973, p. 1194 which quotes 1963 as the base year—we have converted the figures to make the base year 1961 for the sake of clarity.

of the cost of this patient was incurred in the 14 months in her parent hospital before transfer). The most expensive patient cost £11,538; he was the first patient to be admitted in 1961, he has been in this hospital continuously ever since and he draws Sickness Benefit.

#### DISCUSSION

This study has sought to compute the direct cost to the national economy of attempting to rehabilitate, in a unique Regional rehabilitation hospital, a cohort of patients consisting of the hospital's first 200 consecutive admissions. All of them had failed to achieve discharge in the treatment setting to which they had been exposed. To that extent they could all be called other hospitals' failures. Only 100 of the patients retained an ambition to leave hospital; the attitudes of the other 100 had become distorted with time, and 47 of them had reached a state of mind in which from choice they would have remained in hospital for the rest of their lives.

A number were actively psychotic despite medication, a great many were untidy in appearance, unused to looking after themselves and unaccustomed to having any personal possessions to look after (Morgan and Cushing,

1966). Yet there were very few whose habits and behaviour had deteriorated to the extent that they were incontinent or otherwise completely self-neglectful. Most of them, in other words, had retained some assets which it was possible to work on.

Specialized rehabilitation facilities have helped 54 per cent of the cohort to achieve discharge from hospital. Of these only about half (i.e. 26 per cent of the cohort) have stayed out of hospital continuously since their first discharge. The remainder (57 in number) relapsed and were readmitted. Some did this within days of their first discharge, others only after years outside. By the end of the period under review 27 of them were back in hospital but 30 were out, many only after repeated attempts before they succeeded.

Psychiatric rehabilitation is a long process. Faulty habits and attitudes, if they are amenable to change at all, take a long time to correct. The number of sustained discharges continued to climb for four years before it began to level out. Even after that a further 12 patients reached the point of their first discharge. After 8 years there were no further discharges, and it is unlikely there will be more than 2 or 3 more.

The period between 1961 and about 1966 was a time of full employment in the West Midlands of England. Jobs were quite easy to get, and employers tended, in face of the labour shortage, to be tolerant towards the employees they had engaged. From about 1966 until the end of the decade unemployment rose, and jobs became harder to get and keep. We believe this factor has a bearing on resettlement results and merits further study.

It is usually considered that boarding patients out is cheaper than keeping them in hospital. Parry Jones, Buchan and Beasley (1970) described ten years experience of boarding out mentally disordered patients in Somerset. They pointed out that there are hidden costs which have never been calculated. They concluded, 'Boarding out may well be slightly cheaper than hospital care, but our impression is that there is not a lot in it.' Our estimate of how much our day-patients cost is comprehensive if only approximate. The figures are quoted in Table I, but interpretation of them is difficult. The cost

of hospital in-patient care increased dramatically in the years 1963-70. It has always been substantially cheaper to be a day-patient in Malvern than an in-patient at St. Wulstan's, or an in-patient at the most expensive parent hospital. On the other hand the median parent hospital became more expensive than day care in Malvern only from 1966 onwards, and the cheapest parent hospital only from 1969 onwards.

The figures which we have used vary in accuracy. They fall into three groups: (a) Some of the figures are exact, e.g. Sickness Benefit, (b) Others are official averages, e.g. weekly maintenance costs in hospital; (c) The remainder are informed estimates, e.g. Income Tax.

We have calculated and quoted above the absolute cost of the rehabilitation of this cohort. We must now attempt a comparison with the cost of more conventional care. We do not have a control group. We did form one in 1961, and it remained in being in the parent hospitals until 1963 when its members were released from their role in the experiment and a number were transferred here in their turn. At the time it was felt that two years was long enough for both control and experimental group outcomes to have declared themselves. Later experience has shown that two years was far too short, which is unfortunate for our present purpose.

The best we can do, in the absence of a control group, to provide any basis for comparison of our cohort's actual costs is to state what they would have cost in other circumstances. If they had all been transferred here but we had failed to resettle any of them, then allowing for entitlement to Sickness Benefit and for the deaths that occurred, they would have cost £2,128,398. Had they all remained in their parent hospitals instead of coming here and had none of them been discharged, then making the same allowances for benefits and deaths they would have cost £1,350,769. Obviously, some would have been discharged and the cost would have been less, but we have no means of knowing how many or how much less. In reality they cost £1,268,910 which amounts to a 40.3 per cent saving on the cost of keeping

them all here, and a 6.1 per cent saving on the cost of keeping them all in their parent hospitals.

We will confine ourselves to presenting these figures of retrospective costs based on what actually happened, and we will refrain from indulging in any sophisticated projections into the future. But we cannot refrain from mentioning the following facts. At the end of our ten year study 92.5 per cent of our cohort of patients were still alive. They suffer from conditions which do not shorten life. Care of the chronically ill is so expensive, not because unit costs are high, but because the need for care continues for such a very long time. Therefore every successful discharge of a long-stay patient carries a cost benefit which extends into the future far beyond the limits of a ten year study. By the end of our study only 44 per cent of our cohort of 200 people were still hospital in-patients; 48 per cent of the cohort had been enabled to lead lives of varying degrees of independence in the community.

In the recent words of Moores (1973): 'There are viable economic arguments for putting additional resources into well-organized, therapeutic programmes. These relate to the fact that money spent now in making a patient less dependent will result in savings in the future many times greater than this initial investment.'

#### SUMMARY

The total cost of a psychiatric rehabilitation service for long-stay patients has been measured by studying the hospital's first 200 consecutively admitted patients and their careers over the ten years 1961-70.

Account has been taken of every known direct cost to the national economy, of which the Health Service cost is only a part. Account has also been taken of every known direct financial contribution to the economy by successfully resettled patients. No attempt has been made to include indirect costs or contributions.

The maintenance cost in the rehabilitation hospital was about 70 per cent higher throughout the period than the average cost in the hospitals from which the patients came. Despite this, the total net cost of the cohort under rehabilitation was 6 per cent less than it would

have cost to keep all 200 patients throughout the ten years in their previous hospitals.

The extent to which the cost of additional resources has already been offset by some of the patients' success in achieving an independent life has therefore been demonstrated. The trend is likely to continue. All 200 persons who are the subjects of this study entered the decade under review as long-stay patients. Of these, 82 enter the subsequent decade as independent citizens. Their continuing independence is not only gratifying clinically but promises to offset even further the cost of the original investment in an additional rehabilitation service.

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## An Evaluation of a Drug Administration System in a Psychiatric Hospital

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### INTRODUCTION

Previous studies have shown that in-patients in psychiatric hospitals may not always take prescribed drugs reliably (Hare and Wilcox, 1967; Wilson and Enoch, 1967; Irwin *et al.*, 1971).

In recent years systems of administration of drugs in hospitals have attracted critical attention, and the use of transcribed drug sheets has been criticized (Watt *et al.*, 1973a). A new method of drug prescription was introduced by Crooks *et al.* (1967) in Aberdeen. This involved the use of a single prescription sheet, and each instance of drug administration was recorded on a separate recording sheet.

Drug rounds in a psychiatric hospital were observed after the introduction of the system described by Crooks *et al.*, and it was reported that errors of administration were reduced to 0.36 per cent of instances of drug administration (Watt *et al.*, 1973b). The aim of the present study was to attempt to evaluate the new system of drug administration in a psychiatric hospital and part of a mental subnormality hospital by the alternative method of testing the urine of patients for drugs and drug metabolites and comparing the findings with drug administration records.

Methods used in the past for the screening of urine from psychiatric patients have been in the main the side-room tests developed by Forrest and Forrest (1957) and others. These have been shown to be subject to both positive and negative interference, and this is particularly the case when the tests are carried out in the side-room by a variety of individuals.

It seemed that a more analytical approach to the problem of urine testing could lend more objectivity to the clinical findings in studies on drug response, and this seemed to be an oppor-

tunity to test out such a system in practice. Most of the methods used are available in routine clinical chemistry laboratories, and the choice of methods has been designed to provide the maximum number of overlaps so as to improve the selectivity.

### METHOD

The psychiatric hospital studied was Royal Dundee Liff Hospital (610 beds) and the associated general hospital psychiatric ward at Maryfield Hospital, Dundee (20 beds). The new drug administration system had been introduced into these hospitals two years previously.

A 50 millilitre specimen of urine was collected at approximately 6.30 a.m. from each patient under study, and drug treatment was continued as usual. Altogether 236 patients were investigated, including 10 patients in the general hospital psychiatric ward, and tests were made for the following drugs: phenothiazines; tricyclic anti-depressants; phenobarbitone; primidone; phenytoin; trichloryl derivatives; benzodiazepines; paracetamol; salicylate.

All patients receiving the above drugs on a regular basis in each ward on the day of investigation were included, apart from 107 who were unable or unwilling to provide urine specimens. All other excluded patients were not receiving the drugs listed above.

Unfortunately, it was not possible to investigate patients in Royal Dundee Liff Hospital before the introduction of the new system of drug recording, but the in-patients in seven wards of a mental subnormality hospital (Strathmartine Hospital, Dundee) were investigated before and after the change of procedure. Here 42 individuals were studied immediately before the introduction of the new drug administration system and 62 were investigated three months after the introduction of the system. The criteria for selection were as described above.

### Laboratory investigations

#### General

The standard series of tests described below was

applied to each urine, with the exception that the colorimetric test for benzodiazepines was used only with specimens from patients for whom these drugs had been prescribed. The analyst was aware of the drugs prescribed, and when a drug was not found the test was repeated. Equivocal results were checked using the thin layer chromatographic (TLC) method of Berry and Grove (1971). None of the semi-quantitative methods were being used near the limit of sensitivity even in dilute urine, and no attempt was made to determine the levels of drugs even in those methods where quantitation was possible. Discrepancies were only reported if they were clear cut.

#### *Phenothiazines*

(a) The FPN test (Forrest and Forrest, 1957) was used as an initial screen. In patients receiving therapeutic doses of thioridazine the strong blue coloration with FPN does not occur. A pale blue solution with none of the yellow colour of FPN or urine is obtained.

(b) An ultraviolet (UV) screening technique modified from Tompsett (1968a) was used to confirm all positive results given by the FPN test. In this method 10 millilitres urine was made alkaline to phenolphthalein using aqueous 2.5 M sodium hydroxide solution. 25 ml. chloroform was added and the phenothiazine metabolites extracted for two minutes. The chloroform was filtered through Whatman No. 1 paper and the bases back-extracted into 3 ml. 1 M hydrochloric acid (HCl). Chloroform was removed from the HCl by heating in a water bath at 50 °C. for two minutes, and the acid extract was scanned in a Unicam SP800 recording spectrophotometer from 450–200 nm. The traces obtained were compared with those for the unchanged drugs and those for the sulphoxides.

These methods are only valid for the phenothiazines given in high dosage such as Chlorpromazine and Promazine.

#### *Tricyclic anti-depressants*

*Imipramine and desimpramine.* The commonly used screening test of Forrest and Forrest (1960) is not always positive in urines from patients on therapeutic doses of these drugs. A more sensitive and specific test is that of Lemontey *et al.* (1970), and this test was used routinely. It is capable of detecting these two compounds in the urine at the lowest prescribed doses without interference from phenothiazines. The UV screening procedure can also be used for these drugs and is adequate in the absence of phenothiazines.

*Amitriptyline and nortriptyline.* There is no color-

imetric screening test for these compounds, and the UV method was used and was found to be adequate except when phenothiazines were present. In those cases (3) where there was concurrent administration of phenothiazines the thin layer chromatographic (TLC) method was used for the detection of the tricyclic anti-depressants.

#### *Phenobarbitone*

The gas liquid chromatographic (GLC) method of Leach and Toseland (1968) was used with 1 ml. samples of urine; phenobarbitone is detected specifically and consistently by this method, as a large proportion of the drug is excreted unmetabolized. Phenobarbitone is also found in the urine of patients taking primidone. This method can also be used to identify other barbiturates in blood, but as they are mainly excreted as the hydroxy compounds they were not detected in the urine in most cases.

#### *Primidone and phenytoin*

Both of these compounds are excreted mainly as metabolites. There is, however, enough of the unchanged drug in the urine of most patients to be detected if a sufficiently sensitive and selective technique is used.

The method used was modified from that of Gardner-Thorpe *et al.* (1972): 1 ml. 1 M HCl and 10 ml. Chloroform were added to 1 ml. of urine. 10  $\mu$ l. of an internal standard containing Methylphenytoin at a concentration of 1 mg./ml. in Ethanol was added. The mixture was shaken for two minutes, the chloroform layer removed and filtered, dried down, and the residue taken up in 10  $\mu$ l. ethanol for GLC.

(Conditions. Column—3'  $\times$  4 mm. glass column, silanized. Packing 4 per cent cyclohexanedimethylsuccinate on acid-washed silanised Chromosorb W. A Pye 104 gas chromatogram fitted with a flame ionization detector was used. Flow rates: Hydrogen 60 ml./min., air 120 ml./min., argon (Carrier) 60 ml./min. Temperatures: injection 300 °C., oven 235 °C., detector 300 °C.).

Phenobarbitone can also be detected by this method. Specimens from patients receiving primidone invariably contained phenobarbitone.

*Trichloryl compounds*—Fujiwara's test was used. 1 ml. 5 M NaOH and 1 ml. pyridine were added to 1 ml. or urine. The mixture was shaken and heated at 90 °C. for two minutes. The appearance of a red colour in the upper layer indicates the presence of a chloral type compound.

*Benzodiazepines*

No simple test was found which was adequate for the detection of the low dosage benzodiazepines at therapeutic levels. The colorimetric method of Tompsett (1968b) was used. The test is adequate for the detection of nitrazepam and oxazepam at all therapeutic doses, and for chlordiazepoxide and diazepam at doses of 10 mg./day or over. Positive results were not obtained by this method in patients on 5 mg./day diazepam.

*Paracetamol*

The standard screening test for p-aminophenol in urine was used (Meadeall 1972). This test is also positive following ingestion of phenacetin and some sulphonamides (Simpson and Stewart, 1973).

*Salicylate*

Ferric chloride was used as the screening reagent. As some of the other drugs used (notably the phenothiazines) will give false positives with this test a check was made by adding syrupy phosphoric acid to all positive urines. This leads to the discharge of the colour due to salicylate, but not that due to other drugs.

*Thin layer chromatography*

The technique described by Berry and Grove (1971) was used when confirmation was necessary for one component in a mixture of drugs. The main area of use was in the detection of amitriptyline in the presence of phenothiazines. This method was not used routinely on all specimens, as a trial comparison showed that for therapeutic levels it offered no improvement over the methods described above.

## RESULTS

*1. Psychiatric hospital*

The present study involved 236 patients and discrepancies were found between the findings of urine testing and the drug prescription and recording sheets in 43 (18.2 per cent) of these. In 15 individuals (6.4 per cent) one or more prescribed drugs were not detected, in 24 (10.2 per cent) one or more non-prescribed drugs were detected, and 4 patients had both a non-detectable prescribed drug and a detectable non-prescribed drug. None of these inconsistencies could be accounted for by a comparison of drug prescription and administration recording sheets, and the few instances of discrepancy between these sheets were excluded.

Discrepancies were found in 9 out of 100 males (9 per cent) and 34 out of 136 females (25 per cent).

Six of the 43 individuals included in the above list of discrepancies had returned from weekned leave on the day before the specimen was collected, and these included 4 patients in whom a prescribed drug was absent, one in whom a non-prescribed drug was present and 1 showing both forms of inconsistency.

The drugs involved appear in Table I. Of the 337 prescriptions tested for, 21 (6.2 per cent) were not detected, and on another 34 occasions drugs which had not been prescribed were found to be present in the urine. None of the patients whose urine contained non-prescribed phenothiazines or tricyclic antidepressants had received these drugs on prescription during the previous month.

Urine samples were collected from between 1 and 35 patients in 20 different hospital wards, and errors were found in individuals on 13 of these wards. Of these patients, 152 were in long-stay wards, and 17 of these had inconsistencies (11.2 per cent), whereas 26 inconsistencies occurred amongst the 84 patients on short-stay wards (30.9 per cent). This difference was statistically significant ( $\chi^2 = 10.5$ , d.f. = 1,  $p < 0.01$ ) and could not be accounted for by a difference in the numbers

TABLE I  
*Drugs and discrepancies*

| Drug                             | Total instances of prescription | Occasions not detectable | Occasions present when not prescribed |
|----------------------------------|---------------------------------|--------------------------|---------------------------------------|
| Phenothiazine ..                 | 133                             | 6                        | 2                                     |
| Antidepressant ..                | 63                              | 8                        | 3                                     |
| Chloral and derivatives ..       | 55                              | 1                        | 15                                    |
| Phenobarbitone and primidone     | 19                              | 0                        | 0                                     |
| Phenytoin ..                     | 9                               | 0                        | 0                                     |
| Benzodiazepines (ex. nitrazepam) | 11                              | 0                        | 0                                     |
| Nitrazepam ..                    | 45                              | 6                        | 1                                     |
| Paracetamol and salicylate ..    | 2                               | 0                        | 13                                    |
| Total ..                         | 337                             | 21                       | 34                                    |



of drugs prescribed. Fourteen false positive tests for chloral derivatives occurred in three short-stay wards. This was not a transient occurrence, as a similar situation was present on re-testing during part of a further investigation some months later.

Discrepancies occurred throughout the age range and in most diagnostic categories (Table II). The 88 patients who had been admitted to hospital in the year before the investigation was undertaken showed 28 discrepancies (24.1 per cent), and this was significantly more than the prevalence amongst the longer-stay patients ( $p < 0.05$ ). This finding is probably related to the observations about long-stay and short-stay wards described above. The number of inconsistencies on urine testing was not related to the number of regular prescriptions received by the patient.

## 2. The introduction of the new drug administration system to part of a mental subnormality hospital

The results of urine testing before and after the introduction of the new system appear in Table III. Thirty-seven of these patients were investigated on both occasions, and when these were considered alone, they showed two discrepancies before introduction of the new system and one after.

## DISCUSSION

We believe that the system of drug administration described by Crooks *et al.* has many

TABLE II  
*Discrepancies and diagnosis*

| Diagnosis                      | Total patients | Total discrepancies | % discrepancies |
|--------------------------------|----------------|---------------------|-----------------|
| Schizophrenia ..               | 55             | 5                   | 9%              |
| Paranoid state ..              | 16             | 6                   | 37%             |
| Manic-depressive psychosis ..  | 75             | 16                  | 21%             |
| Organic psychosis              | 51             | 7                   | 14%             |
| Neurosis ..                    | 13             | 4                   | 31%             |
| Personality disorder           | 10             | 4                   | 40%             |
| Alcoholism and drug dependence | 7              | 0                   | 0%              |
| Other ..                       | 9              | 1                   | 11%             |
| Total ..                       | 236            | 43                  | 18%             |

TABLE III

*Part of mental subnormality hospital before and after introduction of the new system*

|                                     | No. of patients investigated | Total instances testable drugs pre-scribed | Pre-scribed drugs not detected | Non-pre-scribed drugs detected |
|-------------------------------------|------------------------------|--------------------------------------------|--------------------------------|--------------------------------|
| Before new system ..                | 46                           | 70                                         | 4                              | 0                              |
| After introduction of new system .. | 62                           | 90                                         | 1                              | 2                              |

advantages and can be regarded as an advance on older systems. It would be unfair to expect that the method would eliminate all the problems associated with the distribution of drugs to psychiatric patients. The present results show that two years after the introduction of the system many inconsistencies were found when the records of drugs recorded as having been administered were compared with the drugs which were detectable in the urine. The proportion of discrepancies is of the same order as in other studies using urine testing, although, because of differences in methodology, it is not possible to make an exact comparison.

A recent survey in this hospital showed that disagreement between prescription and recording sheets occurred in between 0.3 per cent and 3.2 per cent of instances of drug administration in various wards in the hospital. This sort of discrepancy was excluded from the present survey by checking the relevant drug sheets.

The investigation of a group of wards in a mental subnormality hospital during introduction of the new system showed that discrepancies occurred both before and after its introduction. Unfortunately, the numbers are too small to reach any firm conclusions about the relative prevalence of discrepancies with the old and new systems.

The possible causes of the discrepancies found include errors in drug administration, a failure of patient co-operation, laboratory errors, and abnormalities of drug metabolism in individual patients. The phenomenon of drug

refusal by patients is well known, and some patients may hoard or secretly dispose of administered drugs.

The number of instances in which non-prescribed drugs were detected is worrying. This could sometimes be accounted for by staff error, and this is the most likely cause of the 14 instances of non-prescribed chloral derivatives found in a group of three wards. Other possible causes include the exchange of prescribed drugs by patients and the bringing of unauthorized drugs into the hospital. It is likely that the salicylates and paracetamol detected in some individuals came from outside the hospital. Many patients are free to leave the hospital and visit their homes or shops, and 6 patients showing discrepancies had returned from weekend leave on the day before the specimens were collected.

The use of random urine samples for the analysis of urine as a check on drug administration is open to criticism. Some drugs, notably the phenothiazines, were excreted at high levels for some time after the dose has been reduced or the drug discontinued. In these cases, it is unlikely that a single missed prescription would be picked up by urine screening. However, many of the prescriptions were for more rapidly excreted drugs.

It is difficult to exclude the possibility that urine specimens may have been mixed up following collection or contaminated during collection. However, great care was taken to prevent such errors, and we think it is unlikely that this contributed to our findings.

In the case of some drugs, the best way to monitor treatment may be to estimate plasma levels at regular intervals. However, many psychotropic drugs are not present in easily measurable amounts in the plasma, and this fact, coupled with the problems of regular venesection in psychiatric patients, has led us to adopt urine testing as the best compromise.

The proportion of discrepancies found here is considerably higher than the error rate of 0.36 per cent reported by direct observation of drug rounds in another hospital using a similar system of drug administration (Watt *et al.*, 1973b). We are at present investigating this aspect of the problem further.

The results of this investigation confirm the necessity for close supervision and control of drug administration in psychiatric hospitals. The possibilities of nurse error and patient non-cooperation should always be borne in mind, and in some cases laboratory tests for drugs in the urine or blood may be valuable. It is likely that no system of drug administration is fool-proof, and we must beware of complacency.

#### SUMMARY

This survey attempted to assess the reliability of drug administration to psychiatric in-patients following the introduction of a new drug administration system. The urines of 236 patients were tested for various psychotropic drugs. In 6.4 per cent prescribed drugs were not detected, in 10.2 per cent non-prescribed drugs were detected, and in 4 patients both kinds of discrepancy were present. The relationships between these discrepancies and certain characteristics of the patients and drugs are discussed. Possible causes of these findings include nurse error, patient non-cooperation, laboratory error and abnormalities of metabolism.

The in-patients resident in a portion of a mental subnormality hospital were also investigated, and discrepancies were found both before and after the introduction of the new system.

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## Descriptive Studies of a Psychiatric Hospital Population

By MICHAEL CLARKE and JANE WALLER

These studies were carried out in Park Prewett Hospital (1,400 beds) which serves most of northern Hampshire, a population of just over 300,000 people. Our aim was to describe in some detail the gross features of this hospital population. Three descriptive techniques were employed.

### 1. ROUTINELY AVAILABLE INFORMATION

The patient residency rate appeared to be one of the highest in the country at 3.8 per 1,000 catchment population (H.M.S.O., 1970). The crude admission rate at 294/100,000 was a little lower than the national rate for Regional Board hospitals, and the turnover at 73/100 beds was one of the lowest in the country. These figures suggested that the hospital had a large predominantly long-stay population. It is, however, important to take three factors into account when considering figures such as these.

- (i) If residency rates are to be used for long-stay institutions, great care should be used in interpretation, since the denominator employed in the calculation of the rate may well have changed and may affect the rate.
- (ii) Clear distinction should be made between *residency* and *admission* rates in long-stay institutions. These are as distinct and as inseparable as prevalence is from incidence, in that residency rates reflect clinical practice over the past thirty to forty years, whereas admission and discharge rates are indicative of current clinical practice. There are essentially two populations in a psychiatric hospital—patients in the short-stay acute wards, and those in the long-stay chronic wards—and different types of data are needed for each.
- (iii) Turnover attempts to express in a single, crude figure the complex interaction between the short- and long-stay parts of a psychiatric hospital. It should be used only with other information on the hospital.

### 2. ONE-DAY CENSUS

The high number of resident patients and the low turnover described in the published figures reflect the *long-stay* hospital. Admissions and discharges do not

reflect the activity of these wards, as admissions are few and discharges are almost exclusively by death. To investigate this part of the hospital, a one-day census of all in-patients was undertaken in February 1970. The data collected on this occasion were as follows: name, hospital number, date of birth, sex, marital status, date of admission, place of residence prior to admission, and diagnosis.

There were 1,280 in-patients, 539 (42 per cent) men and 741 (58 per cent) women. Nearly half (47.5 per cent) were aged 65 or more. Seventy-three per cent of the patients had been in hospital for two years or more. This figure is well above the national proportion of 65 per cent. Four hundred and fifty (35 per cent) people were over the age of 65 and of more than two years duration of stay.

Following the convention adopted by Sainsbury and Grad (1962) we decided to group diagnoses into the following categories: organic psychoses, schizophrenia, other psychoses, neuroses, personality disorders, addiction and others. The census data by diagnosis on admission showed that 82 per cent of in-patients had been diagnosed as suffering from schizophrenia, organic psychoses (mainly senile psychoses) or other psychoses, which were mainly the affective psychoses; 7 per cent had been diagnosed as suffering from a neurosis and 6 per cent from addiction.

The schizophrenics were found to be predominantly middle-aged and had been in hospital for more than five years. Those with organic psychoses were mainly over age 65 and, perhaps surprisingly, over half of them had been in hospital for more than three years.

To analyse the high residency rate in more detail, patients were divided into area of residence before admission. Only half of the present in-patient population came from the current catchment area. Until 1955 the catchment area of Park Prewett had included that part of Wiltshire which was within the Wessex Region (approximately 65,000 people), as well as 155,000 people in Bournemouth. If the present catchment population is used to calculate residency rates, an inaccurately high figure is obtained, since many of the elderly and long-stay patients were admitted from areas for which the hospital is no

longer responsible. Moreover, the age structure has also changed: only 11 per cent of the entire current catchment population are over the age of 65, while in Bournemouth 23 per cent are aged 65 and over.

When residency rates are calculated for patients derived only from the present catchment area they fall to 1.9 per 1,000 population (national rate 2.4 per 1,000 population). For patients aged 65 or more the rate falls to 8.2 from 14.5 (England and Wales rate 8.3).

### 3. ADMISSION COHORT STUDY

This was designed to describe the characteristics of the *short-stay*, high turnover part of the hospital through which most of the admissions and discharges occur.

For our purpose the cohort was defined as all admissions in 1968. For each admission, date of birth, date of admission, sex, marital status and diagnosis on admission were recorded. Dates of discharge or death were collected at the end of 1970 and in this way a two-year follow-up on all 1968 admissions was obtained. This study used all admissions and pooled deaths with discharges, since only a general overview of present activity in the hospital was required.

Females aged 15-34 were more likely to have been discharged by the end of two years than males in the same age group. The reverse of this was true for the 65+ age group, where women had almost twice the likelihood of still being in hospital after two years than men. Only 1 per cent of married people were still in hospital after two years, whereas 11 per

cent of widows and widowers and 8 per cent of single people were still there after the same time period.

### SUMMARY

Three methods of describing psychiatric hospital populations are outlined and discussed.

1. Routine data were shown to give a misleading impression unless factors, such as changes in the catchment area, were taken into account.
2. Census information confirmed the impression that the hospital studied has a large, long-stay, elderly population.
3. The cohort study demonstrated that of those patients admitted during 1968 only 5 per cent were still in hospital after two years. Length of stay varied with age, sex, marital state and diagnosis.

### ACKNOWLEDGEMENTS

These studies are supported by the Department of Health and Social Security. We wish to thank the medical, nursing and administrative staff of Park Prewett Hospital, especially the records department; Wessex Regional Hospital Board for information about the catchment area; Professor John Wing; Miss Barbara Webster and Mrs. Susie Gilderdale.

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## Synopses of Papers Awaiting Publication

### **Diminution of Anterograde Amnesia Following Electroconvulsive Therapy.** By LARRY R. SQUIRE and PATRICIA L. MILLER.

Memory impairment was assessed in psychiatric patients receiving bilateral electroconvulsive therapy for relief of depressive illness. Using delays of up to 24 hours between learning and retention tests, it was demonstrated that anterograde amnesia recovers gradually and is still pronounced at three hours after treatment. Previous reports that learning capacity recovers rapidly after treatment can probably be attributed to the employment of relatively insensitive indicators of memory function. Cumulative effects of electroconvulsive therapy on memory were also observed. Finally, an analysis of errors suggested that the results could best be attributed to a failure to store information properly rather than to a retrieval failure. The usefulness of long-delay retention tasks for assessment of ECT-produced amnesia is emphasized.

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### **Response of Depressed Patients to Methylamphetamine.** By L. G. KILOH, MEGAN NEILSON and GAVIN ANDREWS.

Roberts (*Journal of Mental Science*, 1959, 105, 703-19) claimed that patients with 'psychotic depression' showed an intensification of their symptoms following an intravenous injection of 15 mg. methylamphetamine, whereas patients with 'reactive depression' showed a normalization response, with an 'uplift of mood and a feeling of greater well-being'.

In the present study, 191 patients, including 39 with endogenous depression and 56 with neurotic depression, were given intravenous injections of 15 mg. methylamphetamine. Each patient indicated hourly for three hours whether he felt better, worse or unchanged. The Zung Self-rating Depression Scale (SDS) was completed the evening before and again one hour after the injection.

There was a strong tendency for all groups of patients to feel better irrespective of diagnosis, and there was no significant difference between the responses of patients with endogenous and those with neurotic depression. As a group those who felt worse

showed a much higher incidence of hysterical symptoms and/or hysterical 'personality traits' ( $p < 0.0005$ ).

No significant relationship was found between methylamphetamine response and prognosis, either at the time of discharge from hospital or six months later, in any diagnostic group.

The response to intravenous methylamphetamine would seem to have no diagnostic or prognostic significance in patients with depressive illnesses.

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### **A Prospective Study of the Influence of Post-Graduate Training in Psychiatry on the Rating of Mental Abnormality.** By M. J. KELLEHER.

During their first three days at the Bethlem-Maudsley hospitals, trainee registrars rated a timed videotaped clinical interview of a psychiatric patient who demonstrated symptoms suggestive of schizophrenic, affective and neurotic disorders. They rated the observed abnormalities on a scale (IMPS) written in non-technical language. At the end of two years post-graduate training they re-rated the same tape, using the same scale. Comparisons were made between the registrars' initial and subsequent ratings and also between the registrars' initial ratings and the ratings made on the same tape by Maudsley and American psychiatrists. It was found that the registrars' initial ratings were intermediate between the ratings of Maudsley and American psychiatrists and that after two years training the registrars rated significantly less mental abnormality. The significance of these findings is discussed.

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### **Wilfulness in School Phobic Adolescents.** By IAN BERG and TONY COLLINS.

A questionnaire was devised to measure wilfulness. It was administered to the mothers of eighty youngsters

of secondary school age admitted to a psychiatric in-patient unit. Reliability and construct validity were considered satisfactory. Factor scores were derived from principal component analysis. No age, sex, social class or school effects were found in them. The 43 school phobic individuals in the group were compared to the 37 other cases and no differences were found, especially on the first component which appeared to be a general factor and had been equated with resistiveness. There were indications that the twelve conduct-disordered youngsters in the group were unusually wilful.

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**Independent Transmission of IQ and Schizophrenia.** By MARSHALL B. JONES and DAVID R. OFFORD.

Low IQ is a poor prognostic sign in schizophrenia, and preschizophrenics tend to have lower childhood IQs than their siblings; but the explanation for these relations is uncertain. The reduced IQ may be a prodromal or concurrent effect of the schizophrenia; or the schizophrenia may be partially due to the low

IQ. A decision hinges largely on the correlations for IQ between schizophrenics and their siblings. If the childhood IQs of schizophrenics are lowered relative to their sibs as a prodromal effect, then the proband-sibling correlation should be substantially reduced and certainly lower than the within-sibling correlation. On the other hand, if IQ and schizophrenia are independently transmitted, the proband-sibling correlation should be essentially the same as in families with no schizophrenics. In this study the childhood IQs of 85 schizophrenics and their 208 siblings were collected from the subjects' school records. The correlation between the probands and their oldest sib was .43, between the probands and their average sib .44, while the intraclass correlation among the sibs was .33. These results concord well with those generally reported for sibling-sibling correlations. The evidence, therefore, supports independent transmission and the view that low IQ functions as an unfavourable, largely genetic modifier in schizophrenia.

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## Book Reviews

### PSYCHODYNAMICS

**Alfred Adler: His Influence on Psychology Today.** Edited by HAROLD H. MOSAK. New Jersey: Noyes Press. Pp. 306. Price \$12.50.

Of the three, Jung, Freud and Adler, one hears least these days of Adler, though in fact his Individual Psychology contributes more to the day-to-day methods of most psychologists, social case workers and group leaders.

The concepts that come to mind when one thinks of Alfred Adler are the individual and his life style, inferiority complex, the effect of position in the family and the individual's earliest memories. Adler stressed the influence of the family on the developing child, the relationship between his parents, and the varying effects of the siblings on each other. If Freud stressed the past and Jung the future, Adler, though concerned with both, emphasized even more the here and now. By easy stages he moved on from the family to other social factors, school, work, cultural customs. The titles of two of his best known books, *Understanding Human Nature* (1926) and again *What Life Should Mean To You* (1931), indicate his approach.

The centenary of his birth (1870) led to various commemorative conferences, and this book, authorized by the American Society of Adlerian Psychology, is one of the outcomes. The sub-title '*His Influence on Psychology Today*' indicates the breadth of the approach. In the editor's own words, 'the included papers provide an overview of the current interests of the Adlerian practitioner'. The papers by 33 contributors cover the whole range, Theory, The Neuroses, Therapy, Individual Psychology and Education, Individual Psychology and The Humanities. Most of the contributors live and practise in the States and are for the most part practising psychologists; a few are psychiatrists, others trained as teachers, one was a priest, another a nurse. In England the names of Paul Rom, James Hemming and Lewis Way may be recognized but much more widely known are Danica Deutsch and Rudolf Dreikurs. Harold Mosak of Chicago is the editor.

Adler named his school Individual (*Individuum* means undivided or indivisible) to emphasize his holistic, organismic concept of human behaviour. Later it became known as Adlerian Psychology and by some as Teleo-analytical Psychology. For many people its appeal is that it remains close to day-to-day

reality, not getting lost either in the unconscious or in some aspect of sex. Possibly its biggest appeal at present is that it is always stressing both sides in an interpersonal reaction—what the mother gets as much as what the child requires; what the teacher, as well as the child, finds in the classroom situation; or in intercultural problems, as between black and white, where neither can be said to be the more important. This balanced viewpoint leads straight on to the confrontation between individuals and the groups in which they find themselves. Adlerians have been much concerned with family education centres and with parents' study groups, in fact with much of the group therapy which is now very much in the forefront of social therapy.

Of course, any book with over thirty contributors must be somewhat uneven; and the absence of an index is a drawback. This book is precisely what it claims to be, one giving some indications of Adler's influence on psychology today.

R. F. BARBOUR.

**Models of the Mind.** By JOHN E. GEDO and ARNOLD GOLDBERG. Chicago and London: The University of Chicago Press. 1973. Pp. 220. Price £4.30.

No matter how earnestly one pursues the study of mind, the essential qualities must elude capture. After all, the study itself is an aspect of mind, therefore one must go on studying the study. Hence it is necessary to use models which are metaphors taken from other kinds of study.

Psychoanalysis has provided a number of models which derived in the first place from the practical necessity to offer treatment for mental disorder. The practice preceded the theory and model followed model as treatment became more adventuresome.

The authors of this book have taken three successive models, namely the topographic model, the tripartite model, and the model of the reflex arc. Each model is incomplete. The authors show how the different models of mind have validity in relation to specific stages of development. They have used Freud's work on four classic psychoanalytical case studies to create models of their own of the theory of psychoanalysis in a hierarchical system. It is an erudite and stimulating review, and it opens up psychoanalysis to the use of general systems theory.



The authors arrive at the conclusion that the next task is to devise a nosology based on the regularities which arise from analytical observations rather than on descriptions of types of behaviour.

The book demands careful reading, and further studies by the authors are likely to be equally rewarding.

J. H. KAHN.

#### FORENSIC

**Violence in Human Society.** By JOHN GUNN. Newton Abbot, Devon: David & Charles (Holdings) Ltd. 1973. Pp. 13+180. References and Glossary 7 pp. Index 3 pp. Price £3.25.

This short and unpretentious book, by a senior lecturer in forensic psychiatry, presents an easy, readable but closely-packed summary of contemporary thinking about aggression and physical violence. Obviously the aim was to be as comprehensive as possible. The many subjects touched upon include the sex behaviour of animals, the neurophysiology of the limbic system, the origins of prejudice, psychopathic personality, riots and civil disorders, dangerous driving, violence of schizophrenics, and methods of social control. With such a profusion of topics, none could be dealt with extensively. The frustration theory of aggression, to which psychologists have devoted countless volumes and innumerable research reports, is here disposed of in two pages. Only one experiment is cited, and that example takes up only three sentences. With such a degree of compression, the reader is prone to a certain mental indigestion, as whole new areas of scientific inquiry open up and fade away again with almost every turn of the page. Nevertheless, at every turn Dr. Gunn manages to slip in a sizeable dose of useful information and timely, sensible comment. As an introduction to the problems of violence in society the book is excellent, but it has not much new to offer by way of solutions to the scientific, social and political controversies involved.

On the whole, Dr. Gunn preserves a sensible balance between theories about individual propensity to violence and theories about social pressures towards violence. He is, however, more at home with psychological interpretations and clinical observations than with theories of social structure. He includes a brief statement of theories of social alienation and the subculture of violence, but appears to regard such phenomena as a kind of social pathology rather than as an inevitable consequence of the competitive values of modern industrial society. He begins to explore the connection between the legitimization of oppression, which occurs in authoritarian and coercive systems, and the spread of violence as an instrument

of social protest and a form of political expression. But the exploration does not proceed very far. He is inclined to make too sharp a division between the 'normal' violent offender, as exemplified by the aggressive driver, whom many people accept as 'non-criminal', and the serious deviant, as exemplified by the street mugger, who is labelled criminal and unacceptable.

D. J. WEST.

**Depression, Psychopathic Personality and Attempted Suicide in a Borstal Sample (A Home Office Research Unit Report).** By H. SYLVIA ANTHONY. London: H.M.S.O. 1973. Pp. viii+44. Price 36½p.

The original aim of this study was to try to coalesce some earlier work of Mrs. Anthony indicating from a sample of psychiatric patients that low psychomotor tempo is significantly related to diagnosed depression, and from a sample of young offenders that those with a record of convictions for assault responded on a psychomotor test in the manner of depressive patients.

However, the inmates of the chosen borstal were allocated there because of the special provision of psychiatrically qualified medical care; and, perhaps not surprisingly, the personal violence exhibited by this sample tended to be of a different character (usually sexual) from the generally mundane brawling and fighting which characterized the violent offenders of her previous study. Rejecting this institution as a suitable venue for testing her hypothesis of association between assaultive violence, psychomotor response and psychiatric diagnoses, she noted that one-third of the sample had a record of attempted suicide, so violence against *themselves* was quickly substituted for violence against *others* in a reformulation of the hypothesis. Rather more hopefully than convincingly, Mrs. Anthony maintains that 'there was no reason to suppose that these attempters were qualitatively unrepresentative of delinquent young men with a record of attempted suicide'. One must remember that these were boys specially selected to respond favourably to psychotherapy rather than authoritarian discipline (p. 2); and one should recognize that prison medical officers are hardly likely to select a random sample of attempted suicides, for, after all, they may agree with the author who asserts that 'depression may be more amenable than psychopathy to psychiatric and social treatment' (p. 10). With these reservations in mind, the results are clearly presented to show the apparent relation between violence against the self (attempted suicide) and the psychomotor behaviour associated with depression.

What seems puzzling is that the author states (p. 5) that the courts receive expert medical advice before

sentencing to borstal, but she seems to reject the potential of this procedure. Instead, she has gone to an obviously helpful but inappropriate borstal whose particular population prevented the testing of the original hypothesis, and so has perhaps rather undermined the general value of her present findings.

KEITH SOOTHILL.

### TEXTBOOKS

**Child Psychiatry for Students.** By F. H. STONE and C. KOUPERNIK. Edinburgh and London: Churchill Livingstone. 1974. Pp. xi+110. Index 4 pp. Price £1.00.

As pointed out in the foreword, child psychiatry is a young speciality, and only very recently has thought been given to teaching undergraduates.

In this book there is good emphasis on relationships and a feeling throughout of genuine concern for children and families. The reader is taken through a reasonable sequence of development, aetiology, assessment, diagnosis and treatment to the last chapter with some ideas on family needs and pathology. There is a strong plea always to consider multifactorial causes.

The authors stress the need for a broad approach, but nonetheless the book has a very definite bias. Whereas terms derived from analytic concepts are given firmly and clearly throughout, there are only three very brief references to ideas based on learning theory and behaviour modification techniques. A multidisciplinary approach is mentioned in the foreword but is only definitely stated in the text in the very last paragraph. It might also have been useful to stress more clearly the need to separate observation from theoretical interpretation. There are other contentious points, but most could be accepted as individual opinion in a field as new and rapidly developing as this.

However, few books give a brief account of child psychiatry and also provide a general view of the concepts, and this would be a useful book for teachers to recommend to undergraduates as a basis for subsequent seminar discussion.

H. ZEITLIN.

**A Companion to Medical Studies. Volume 3. Parts 1 and 2.** Edited by R. PASSMORE and J. B. ROBSON. Oxford: Blackwell Scientific Publications. 1974. Pp. 1155 (Part 1), 1125 (Part 2). Illustrated. Price £8 each part.

This new, modestly priced textbook of medicine is a most excellent, comprehensive work covering, in Volume 3, the areas of medicine, surgery, systematic pathology, obstetrics, psychiatry, paediatrics and community medicine. In contrast to many other

medical textbooks, it is written in plain English. Moreover, the editors show a commendable concern for the dignity of the individual who is our patient. At a time when humanistic medicine is in danger of being swept aside by technological gimmickry, it is heartening to read (in the Introduction) that: 'clinical medicine involves a personal relationship between patient and doctor, and both diagnosis and treatment of a disease are influenced by the success or failure of this relationship'.

Unfortunately, this 'whole person' approach to medicine, which demands that the doctor treat not merely the disease but the patient, has failed to permeate a number of chapters particularly those dealing with surgical topics. It is regrettable, for example, that the profound psychological disturbances which may follow such operations as laryngectomy, hysterectomy and radical mastectomy are totally ignored. On the other hand, the inclusion of a section on psychological aspects of limb amputation is to be welcomed. Many important topics usually omitted or insufficiently discussed in other general textbooks of medicine are explored here, *inter alia* care of the dying, problems of over-population, planning and sociology of health services, sexual behaviour and disorders, genetic counselling, and the management of intractable pain. In general, the contributions, including those on psychiatry, are of a very high standard indeed.

Although written for medical students, *A Companion to Medical Studies* is also invaluable for all doctors, whatever their specialty. It deserves success.

S. GREER.

### SAMARITANS

**The Samaritans in the 70's.** Edited by CHAD VARAH. London: Constable. 2nd ed. 1973. Pp. 260. Price £2.50 (cloth), 95p (paper).

Chad Varah began offering telephone counselling in Manchester in 1953 to anyone contemplating suicide; he and his volunteers were christened 'Samaritans' the next year in a *Daily Mirror* headline. Their most crucial activity, 'befriending', has a function and rationale which distinguishes itself from counselling and treatment, and this distinction is the underlying theme of the book.

The history, principles and 'mystique' of the Samaritans are presented in an engaging style, and the account by Chad Varah of befriending may introduce psychiatrists to a service which can complement their own activities. The book is principally intended for Befrienders themselves, and has helpful explicit chapters which provide guidance in dealing with sexual problems, alcoholism, bereavement, complaints relating to ageing, anxiety, alcoholism,

loneliness, and of course, suicide. Many of the contributors are psychiatrists who point out the more subtle signs of various psychiatric states as they may present to a non-professional. With the help of the better written anecdotal accounts of Varah, the book provides useful background information about mental illnesses, their danger signals and the special contribution befriending has to make. The advice is generally sound, and except for an excess of half-page contributions which tend to detract, the book is readable and can be recommended to medical students and paramedical workers and to any interested persons wanting to know more about this helpful organization and the nature of their work. A list of telephone centres in this country and abroad can be found at the back of the volume.

STEVEN R. HIRSCH.

### MISCELLANEOUS

**Ethology and Development.** Edited by S. A. BARNETT. London: William Heinemann Medical Books Ltd. 1973. Pp. 128. Illustrated. Price £3.30.

This collection of essays is heterogeneous both in subject matter and quality. Dobbing and Smart give a good description of the effect of early undernutrition on later behaviour and brain development in the rat. Bateson describes laboratory work on imprinting in nidifugous birds. Ader describes the effect of a variety of early experiences on the subsequent development of gastric erosions in the rat.

An essay on early social deprivation in the later behaviour of macaques illustrates the crudity of much of this work. The deprivation is usually too extreme for such a very gregarious species, and the experiments are not well controlled. For instance, partial *rhesus* isolates over 10 months old who had experienced only *rhesus* monkeys of the same age preferred, on testing, an adult female *pigtail* macaque to an adult female *rhesus* macaque; the authors attribute this to negative play experiences with the *rhesus* infants, but there was no control group who had play experiences with *pigtail* infants. Those who are impressed by Harlow's finding that *rhesus* infants prefer an artificial cloth-covered mother to a wire mother which provides milk should look at the picture on page 53; they will see that the cloth mother has a face whereas the wire mother does not. The most interesting observation was that two baby *rhesus* monkeys reared together but otherwise isolated appeared to develop normally.

Most of the material in this book can be read elsewhere. It is all laboratory work, mostly on rats, and has little to do with ethology as the term is generally understood. The authors appear to disapprove of ethologists, particularly Konrad Lorenz and his

colleagues, and of 'some, especially psychiatrists, who have not only been sympathetic to the approach, but have enthusiastically peddled as self-evident truths some of the more dubious ethological theories.'

In these days of austerity, this book should be high on the list of items for self-deprivation, and is not recommended for personal or library purchase.

JOHN S. PRICE.

**Student Health.** By PHILIP CAUTHERY. London: Priory Press Ltd. 1973. Pp. 160. Price 80p.

According to the blurb this book is intended for doctors and nurses, while in his preface the author states that it is for the interested layman, e.g. tutors. He admits he is neither psychoanalyst nor psychiatrist, nor altogether familiar with the published literature. This may account for the reading list given at the end failing to make any distinctions between popular paperbacks and advanced postgraduate textbooks, and omitting such a useful review as Payne's *Research in Student Mental Health*, London, 1969.

The author is University Physician at the University of Aston in Birmingham, and is well known for his work in sex education. He has clearly had a great deal of practical experience with student problems, and provides many interesting examples and insights. There is a Foreword by Dr. Nicholas Malleon twelve chapters and a useful index. The bulk of the book is devoted to psychosocial, sexual and psychiatric topics relevant to student health and adjustment including examination strain and work difficulties. There are a few minor misprints, e.g. *inposion* (page 105).

The author does not seem to allow any place for the clinical or educational psychologist. Nothing is said about the Abortion Act or the Mental Health Act, nor about such general problems as medical confidentiality or student selection. There is, finally, too great a reliance on, and too much space given to, old fashioned Freudian concepts.

F. E. KENYON.

**Dreams and Dreaming. Selected Readings.**

Edited by S. G. M. LEE and A. R. MAYES. Harmondsworth, Middlesex: Penguin Books Ltd. 1973. Pp. 482. Index 26 pp. Price £1.25.

This paperback, one of a series of Penguin Modern Psychology Readings, is a selection of published articles on the subject of Dreams (the content) and Dreaming (the act of dreaming irrespective of content). The section on Dreams is sub-divided into three parts on Ancient Theories, Modern Depth Theories and Empirical Studies. The first two parts provide the greater interest, with a fascinating account of historical and anthropological aspects of dreams by R. L. Van de Castle in the first and

Ernest Jones on Freud and Jacobi on Jung in the second. Part III is largely devoted to studies of children's dreams and the effects of hypnosis on dream content.

The section on Dreaming is also in three parts, Rapid Eye Movement Sleep, the effects of Rapid Eye Movement Sleep Deprivation and Theories and Future Prospects. Because of the recent information explosion in sleep physiology this section has a distinctly arbitrary appearance, and many of the pre-1970 articles are somewhat dated. Nevertheless the selections do convey many of the current views of the significance of rapid eye movement (paradoxical) sleep.

This volume is not intended to be comprehensive and is only to be regarded as an *apéritif*, but a further reading list is appended for the reader whose appetite has been whetted.

K. DAVISON.

**Patient Power: The Development of a Therapeutic Community in a Psychiatric Unit of a General Hospital.** By P. M. MARGOLIS. Springfield, Illinois: Charles C. Thomas. 1973. Pp. xv+154. Index 2 pp. Price \$8.95.

This book describes the development of a therapeutic community approach in a psychiatric unit in an American general hospital formerly run on traditional medico-centric, authoritarian lines. The book is clear, clinical and anecdotal; a few activities described as research are alluded to briefly, but not so that their academic value can be assessed. It may be of interest to clinicians interested in exploring milieu therapy possibilities in British units. It does not deal directly with any of the complex issues concerning the applicability, disadvantages or effects of milieu therapies, and it is probably a book for the converted.

J. P. WATSON.

**Patients, Practitioners and Medical Care.**

By DAVID ROBINSON. London: William Heinemann Medical Books. 1974. Pp. xiv+178. Index 3 pp. Price £1.15.

There must be something wrong with a book written to introduce sociology to medical students that leaves an initially sympathetic reviewer feeling irritated and intolerant. It is, I suspect, its sociological style and a lack of awareness of the 'medical viewpoint'. Dr. Robinson's 'symptomatic persons' appear to bear little relation to our knowledge of patients and practical medical problems, and yet he has a great deal of value to say. Medical sociology (like psychiatry) can surely be only taught to doctors if it is shown to be useful and relevant rather than a

separate and esoteric specialty. This must mean that the new ideas are introduced in a familiar medical context and language, and are shown to be important for management and clinical practice.

It is sad that Dr. Robinson has failed to make exciting an approach that is still greatly neglected by doctors.

RICHARD MAYOU.

**Crisis Intervention and Counseling by Telephone.** Edited by D. LESTER and G. W. BROCKOPP. Springfield: Charles C. Thomas. 1973. Pp. xi+322. Price \$11.95.

'Most communities today have a suicide prevention service, one or more teenage hotlines, a drug hotline or information service, a poison control center, a rumor control center, and more rarely a specialised service for the elderly.' The burgeoning telephone counselling services in America, described in this book by workers from several suicide prevention and crisis centres, show in comparison with the Samaritans in Britain a greater diversity in use, a seemingly less stringent selection of volunteers, and a smaller likelihood of providing personal continuity of care. In suicide rates, Weiner in California found there was no change, while Bagley in England showed a decline for towns with such centres in contrast to those without. It is a pity that evaluation of such services is so 'rarely attempted'.

H. G. S. SERGEANT.

**Neonatal Behavioural Assessment Scale.** By T. BERRY BRAZELTON. Spastics International Medical Publications in association with William Heinemann Medical Books London. 1973. Pp. ix+66. Index 2pp. Scoring definitions and Scoring sheet 6 pp. Price £2.50.

This book describes the scale designed by Brazelton to assess individual differences in neonates. Earlier predominantly neurological scales such as that of Prechtl, though important in their own right, have been disappointing in their ability to describe and predict differences in infant behaviour. Brazelton a paediatrician at Harvard, has attempted to design a scale in which the main neonatal differences measured are those which might be relevant to the development of the infant's social relationships.

His work reflects the growing interest in the infant's contribution to mother child interaction, and it now seems astonishing that in the past studies of child development have almost ignored this half of the equation. Brazelton has given us a rigorously produced instrument to examine this area and has forged a link between the neonatal state and the psychiatric studies of temperamental characteristics. Already in

this country his work has started a fruitful dialogue between research paediatricians and developmental psychologists.

As always with the Clinics in Developmental Medicine the book is immaculately produced, and there are many illustrations. The scale is designed to measure an infant's best performance, and it becomes clear from the book that one of the most important points in its development has been Brazelton's obvious empathy with the babies he studies. The scale should be available in any unit interested in child development.

STEPHEN WOLKIND.

**Mental Illness in Kensington and Chelsea, and Hammersmith.** By GERALD WOOLFSON, PHILIP KENNING, CHRISTINA WATSON and JOHN WILDER. Psychiatric Rehabilitation Association. 1973. Pp. 37. Price £1.50.

This is a detailed study of psychiatric patients discharged into 'the community' from the hospitals in these two boroughs. Its first purpose was to confirm that there are quantitative and qualitative variations

in the distribution of discharges, and consequently in the need for community facilities. Its second purpose was to show the inadequacy of these facilities and offer guidance in planning them. As the authors point out, these boroughs have very individual characteristics and not surprisingly the first aim of the study was clearly realized. Both boroughs are shown to have above average discharge rates, with differential rates dependent on the characteristics of the areas concerned. In Kensington and Chelsea there was a high rate for patients with a diagnosis of personality disorder; in Hammersmith the schizophrenia discharge rate was 179 per cent of the national rate for men and 235 per cent of that for females.

Although unsurprising, the results will remain significant so long as this obvious point remains underestimated in planning.

The second aim of the study is less fully realized. The suggestions made for improving community facilities are very general and briefly set out. A further study in this difficult area would be welcome.

D. ABRAHAMSON.

## Books Received

### PSYCHIATRY, PSYCHOANALYSIS AND PSYCHOLOGY

- Psychiatry and the Law—The Crusade Against Involuntary Hospitalization.** By D. MARTINDALE and E. MARTINDALE. *Windflower Publishing Co.* Price \$4.50.
- Contemporary Issues in Psychiatry.** By J. G. HOWELLS. *Butterworth.* Price £4.00.
- Camping Therapy—its Uses in Psychiatry and Rehabilitation.** Edited by T. POWER LOWRY. *Charles C. Thomas.* Price \$7.75.
- Psychology and Common Sense.** By R. B. JOYNSON. *Routledge and Kegan Paul.* Price £2.50 (cloth), 95p (paperback).
- Dementia in the Presenium.** By A. E. SLABY and R. J. WYATT. *Charles C. Thomas.* Price \$12.75.
- Psychiatry in a General Hospital.** By J. CRAWFORD LITTLE. *Butterworth.* Price £2.00.
- Analysis of Groups.** Edited by G. GIBBARD, J. HARTMAN, and R. MANN. *Jossey Bass.* Price £7.50.
- Ethology and Psychiatry.** Edited by N. F. WHITE. From the Clarence M. Hincks Memorial Lectures, held at McMaster University, 1970. *University of Toronto Press.* Price £1.90.
- Clinical Psychology—The Study of Personality and Behaviour.** By S. L. GARFIELD. *Aldine Publishing Co.* Price \$14.95, \$8.95 (paperback).
- The Undiscovered Self.** By C. G. JUNG. *Routledge and Kegan Paul.* Price 70p (paperback).

### CHILDREN AND ADOLESCENTS

- Children in Danger—the Causes and Prevention of Baby Battering.** By JEAN RENVOIZE. *Routledge and Kegan Paul.* Price £2.50.
- Invisible Men—Faces of Alienation.** By G. VICTOR. *Prentice-Hall.* Price \$6.95.

### BEHAVIOUR

- Experimental Behaviour—a Basis for the Study of Mental Disturbance.** Edited by J. H. CULLEN. *Irish University Press.* Price £7.00.
- The Four Horsemen—Racism, Sexism, Militarism and Social Darwinism.** Edited by ETHEL TOBACH. *Behavioral Publications.* Price \$7.95.
- Symposium on Love.** Edited by M. E. CURTIN. *Behavioral Publications.* Price \$9.95.
- Driver Behaviour. Principal Conclusions and Recommendations of the First International Conference on Driver Behaviour.** Zurich 1973. *International Drivers' Behaviour Research Association.* No price stated.
- Man at the Wheel—A New Means of Understanding him.** *International Drivers' Behaviour Research Association.* No price stated.

- The Thyroid Axis, Drugs and Behavior.** Edited by A. J. PRANGE, JR. *Elsevier/Excerpta Medica/North-Holland.* Price \$17.50.

### SCHIZOPHRENIA

- Schizophrenia: The first ten Dean Award Lectures.** Edited by S. R. Dean. *MSS Information Corporation.* Price \$12.95.
- The International Pilot Study of Schizophrenia, Vol. 1.** *World Health Organization.* 1973. Price Sw. fr. 56.

### SEXOLOGY

- Splitting—A Case of Female Masculinity.** By R. J. STOLLER. *Hogarth Press and Institute of Psycho-Analysis.* Price £5.50.
- Lesbianism—A Study of Female Homosexuality.** By D. H. ROSEN. *Charles C. Thomas.* Price \$7.95, \$4.95 (paperback).

### COMMUNITY, SOCIAL AND ALLIED MATTERS

- A Social Work Guide for Long Term Care Facilities.** By E. M. BRODY and Contributors. *National Institute of Mental Health.* No price stated.

### REPORTS

- Ministerial Statements, Agenda, Communiqué and other related Documents.** *Federal Provincial Conference on Corrections.* December 1973. Ottawa. No price stated.
- CIBA Annual Report.** *Ciba Foundation.* No charge.
- Cogstats—Some Notes on the Use of Statistics in the Divisional Management of Hospital Medical Services.** By D. MORRIS, M. BUCKLER, F. GOSS, J. HARVIE, R. WILLIAMS and I. WILLOX. *King Edward's Hospital Fund for London.* Price £1.75.

### PENGUINS AND PELICANS

- The Life and Work of Sigmund Freud.** By E. JONES. Edited and abridged by L. TRILLING and S. MARCUS. *Penguin Books.* Price £1.25.
- The Social Psychology of Work.** By M. ARGYLE. *Penguin Books.* Price 60p.
- A Question of Madness.** By Z. A. MEDVEDEV and R. A. MEDVEDEV. Translated by ELLEN DE KADT. *Penguin Books.* Price 40p.
- Love.** By R. HAUGHTON. *Penguin Books.* Price 40p.
- Stardom—The Hollywood Phenomenon.** By A. WALKER. *Penguin Books.* Price 55p.

Many of these books will be reviewed at a later date.

## Correspondence

*Letters for publication in the Correspondence columns should be addressed to:*

The Editor, British Journal of Psychiatry, Chandos House, 2 Queen Anne Street, London, W1M 9LE

### CREATINE PHOSPHOKINASE AND PSYCHIATRIC ILLNESS

DEAR SIRS,

The recent report by Cunningham *et al.* in your January issue (124, 87-91) implies that finding increased serum creatine phosphokinase (CPK) activity in only 9 of 296 psychiatric patients (3 per cent) without 'accepted' possible causes of increased serum CPK activity is a refutation of the claims of myself and colleagues in seven publications of six different patient groups, which have been supported by ten other published investigations (see Meltzer, 1974; Foster and Kupfer, 1973), that serum CPK activity is elevated in most acutely psychotic patients who have been studied in the earliest days of their psychoses.

There are many possible reasons for the findings of Cunningham and his co-workers. Firstly, the claims I and other investigators have made of increased serum CPK activity in psychiatric patients have been almost exclusively confined to patients with *psychotic* symptoms. The Cunningham study does not separate patients into psychotic and non-psychotic groups. Conceivably, the percentage of acutely psychotic patients with increased serum CPK activity could have been as high in the Cunningham study as previously reported in other studies.

Secondly, my previous studies have emphasized the need to study acutely psychotic patients with very recent onset of psychotic symptoms—preferably no more than one week, and to study them repeatedly throughout their stay in hospital, since about as many patients first have increased CPK activity during periods of further decompensation in the hospital as have increased CPK activity at admission. We have also found that intensity of psychotic symptoms is highly correlated with increased serum CPK activity. No data are presented by Cunningham *et al.* as to the time of onset of the illness of those patients who were psychotic; the severity of symptoms is not commented on; and only one serum CPK sample, obtained at admission, was studied. All three factors could greatly contribute to the small percentage of patients with elevated serum CPK activity.

Thirdly, Cunningham and his co-workers consider that in none of the patients with CPK increases who had had intramuscular injections could the CPK increases be associated with psychosis *per se*. We have shown that 8 of 14 (57 per cent) patients given a 50 mg. intramuscular (i.m.) injection of Thorazine<sup>R</sup> did not have increased serum CPK activity at any time during the next five days (reviewed in Meltzer, 1974). The decision to reject all patients who had *any* injection within one week of admission as possibly having an increase due to psychosis *per se*, while justifiable in some respects, is designed to produce the maximum number of false negatives. Since the patients most likely to receive i.m. injections in a psychiatric hospital are usually the severely disturbed acutely psychotic patients who are most likely to have increased serum CPK activity, it is necessary to make a special effort to reduce the use of the i.m. route of medication in a study of serum CPK activity so as to avoid elimination of a majority of the most relevant subjects from the study. The absence of such an effort by Cunningham *et al.* undoubtedly reduced the percentage of patients with increased serum CPK activity not due to 'accepted' causes.

Fourthly, Cunningham *et al.* relied on their clinical laboratory for CPK determinations. This laboratory utilizes one normal range of serum CPK activity for all humans (25-145 mU/ml.). It has been established beyond any doubt in numerous publications that serum CPK levels vary by sex, females generally having serum CPK activity 40-60 per cent lower than males. The upper limit of normal for females, using the method employed by Cunningham *et al.*, has been estimated at 97 mU/ml. (Miyada, Nakamura, Boyko, 1972). Thus the female patients in this study were not tested against the appropriate upper limit, and this could have led to many false negatives.

The final possibility to explain the small percentage of elevated serum CPK levels in this study is laboratory error. Clinical laboratories, after all, are far from ideal for research purposes. CPK determinations are open to many sources of error. It is extremely easy to inactivate CPK. Precautions must be taken to restore some of the lost activity due to oxidation of

sulfhydryl groups before determining the enzyme activity. Cunningham *et al.* say that the study was performed shortly after the Barnes Hospital laboratory began determining CPK activity. No data are presented about the accuracy and reliability of the laboratory's determination at that time. Farina, Litwinko and Bremner (1973) have called attention to inaccuracies of 30-70 per cent in CPK reference sera for the Auto-Analyser method employed by Cunningham *et al.* Such errors rarely occur in a research laboratory which is devoted to high accurate and reliable determinations of selected biological variables. There is no way of ascertaining whether major errors of this type occurred in the Cunningham study, but they certainly could have.

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DEAR SIR,

We do not claim that we have refuted Professor Meltzer's findings; rather that our study fails to confirm them. We began investigation with the hope

that some small group of rigorously defined patients would show consistent elevations of CPK. That none did surprised us.

We agree with Professor Meltzer that one feature of our research design, namely failure to withhold intramuscular injections, rendered our study an inadequate test of his claim. However, the bulk of research on this subject—research which Professor Meltzer cites in support of his position—not only incorporates this same defect of design but is compounded by other deficiencies. For instance, the established relationship between alcohol and elevated CPK has been largely ignored in CPK investigations. Chronic heavy alcohol intake is very common among psychiatric in-patients, including those with an admitted diagnosis other than alcoholism.

Regarding the criticism that we do not provide the time of onset of illness, we would suggest that a glance at Table II indicates such information is available.

The problem of who is psychotic and who is not is perennial. Use of the term has been confusing for at least a half a century. Renard Hospital is an acute treatment centre in an urban setting. Approximately a quarter of our patients are admitted with hallucinations, delusions or what is sometimes described as 'loss of contact with reality'. We investigated these patients as well as others.

Professor Meltzer's hypothesis has not been refuted. But it has not been confirmed, and will not be until prospective studies are accomplished in which intramuscular injections are withheld, patients with other potential causes of elevated CPK are carefully removed from study, and rigorous criteria for establishing the diagnosis of 'acute psychosis', dating its onset and evaluating its intensity are developed.

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- 1 *Modern Med.* 17, 438, 1972
- 2 *Practitioner*, 210, 135, 1973
- 3 *Am J. Psychiatr.* 130, 1142, 1973
- 4 *Practitioner*, 198, 80, 1967
- 5 *J. Roy. Coll. Gen. Practit.*, 23, Suppl. 2, 33, 1973
- 6 *Practitioner*, 199, 325, 1967

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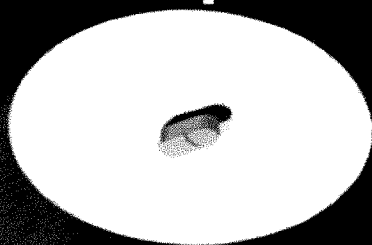
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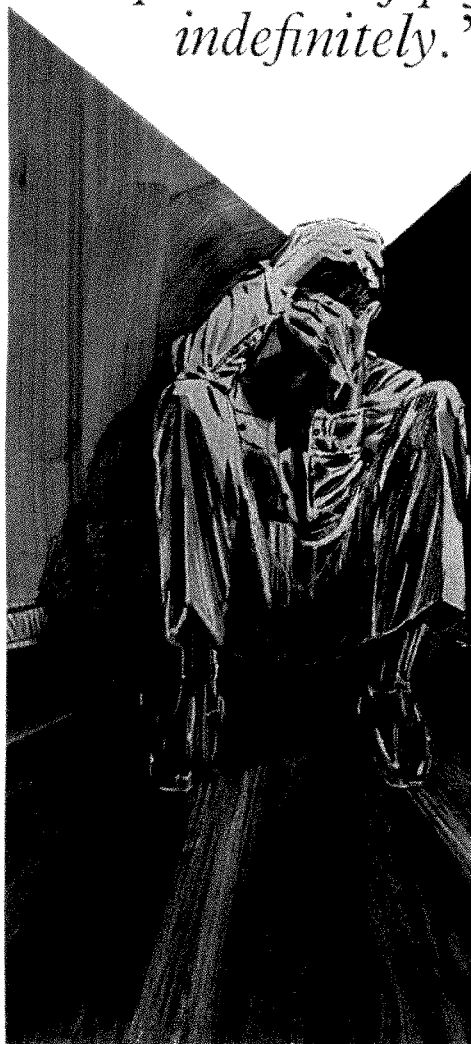
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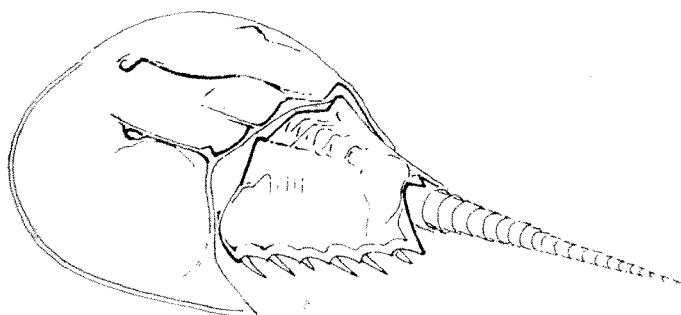
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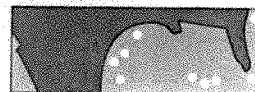
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## The Personality in Psychomotor Epilepsy Compared with the Explosive and Aggressive Personality

By PER KRISTIANSON

### INTRODUCTION

Amark (1951, p. 154) discovered a high frequency of ixoid and ixothymic personality traits resembling those encountered among epileptics in a clinical material (49.5 per cent), and institutional material (38.0 per cent) and a material from the Temperance Board (37.1 per cent). Amark's description of these 'epileptoid' personality traits (1951, p. 151), which also covers normal character variations, is fairly wide and includes a tendency to perseveration, adhesiveness, explosions or dysphoric states of dejection, querulousness and paranoid reactions. In a previous study (Kristianson, 1970, p. 173) it was suggested that Amark probably overestimated the frequencies of ixoid and ixothymic personalities, because alcoholics are so often explosive. But this quite unspecific pattern of behaviour is not sufficient for the diagnosis of 'epileptoid' traits, if this concept is to have a reasonable definition. Explosive aggressiveness is scarcely a primary personality trait, but is one of the symptoms of a deterioration in the chronic alcoholic's mental condition. However, it is important to differentiate these explosive aggressive reactions caused by chronic alcoholism from the adequately defined personality traits of epileptics. This problem of differentiation will be analysed in greater detail in this study.

### *The definition of some personality traits of epileptics*

In her critical survey of studies reported in the literature, Tizard (1962) discussed the evidence for the epileptic personality, but she found it difficult to interpret the results of the investigations examined, as the patient groups were chosen according to highly uncertain clinical and EEG criteria. The psychiatric disturbances proved to be undefined in all the clinical studies reported. Bingley (1958) was the only author worthy of praise for the reliability of his EEG

tests (Tizard, 1962, p. 198). It may also be mentioned that Tizard was very critical of the test instruments used in this field. The findings of studies in which the Rorschach test has been used have been shown to be contradictory, and the inadequacies of this test for research purposes have been pointed out. It is also argued that progress in this field depends on the development of reliable and valid test instruments and on the development of reliable criteria with which to classify epileptics (Tizard, 1962, pp. 207-8).

Since 1950, temporal lobe epilepsy has been associated in the literature to a large extent with certain personality disturbances. Although there may also be a special non-temporal form of epilepsy which is described as 'Aufwach' grand-mal epilepsy with other characteristic personality traits (Janz, 1969, pp. 468-70), it is possible that a stricter definition of the personality traits of at least some important form of psychomotor-temporal-lobe epilepsy could be achieved by a more accurate plotting of the brain changes which cause this form of epilepsy.

Bingley's work (1958) is highly relevant for a stricter definition of these personality traits. Therefore I thought it fitting to begin with a detailed examination of an important part of his work and to use it as the basis of a comparison with some other relevant studies. Among these are a Rorschach study by Delay *et al.* (1958) and a clinical and psychometric study by Gastaut *et al.* (1955). The other works on epilepsy to be discussed were published later than Tizard's review of the studies reported in 1962. Then I intend to select a suitable psychometric measurement of carefully defined personality traits of some form of psychomotor epilepsy for comparison with a measurement of explosive aggressivity.

Bingley studied the personality changes be-

tween seizures in 90 cases of temporal-lobe epilepsy (1958, pp. 123-8). It may be observed that he only included symptoms directly caused by the cerebral disease in the final assessment of personality changes. Symptoms of reactive neurotic or psychotic depressions were not included in this assessment (Bingley, 1973, personal communication). Furthermore, he has informed me that the majority of patients were on dilantin sodium (100 mg.  $\times$  3 daily) and barbiturates (50 or 100 mg. daily). But the dosage of barbiturates was not so high as to explain the epileptic personality changes observed. Pond (1971) has also pointed out that acute symptoms caused by anti-convulsant drugs clear up when the dosage is reduced and that there is no convincing evidence that there are any permanent after-effects even after years of chronic anti-epileptic medication. Reynolds (1967) described four cases of schizophrenia-like psychoses of epilepsy associated with disturbances of the folate and vitamin B<sub>12</sub> metabolism induced by treatment with anti-convulsant drugs. However, definitive proof is lacking with regard to the role of drug-induced folate and vitamin B<sub>12</sub> deficiencies in epileptic personality changes (Davison and Bagley, 1969; Snaith *et al.*, 1970). Compare also Bruens (1971), who diminished the serum folic acid concentration in five cases of epileptic psychosis; in none of these cases did folic acid administration have any effect on the psychosis.

Bingley found that the most common personality change was an 'epileptic personality type' whose most outstanding feature was 'adhesiveness' in the intellectual, emotional and volitional spheres, described by Strömngren, for instance, as 'ixophrenia'. Secondary features often associated with this syndrome included intellectual retardation, circumstantiality, stubbornness and pedantry. Emotional changes in the form of dysphoria and irritability were common, sometimes associated with explosiveness and aggressiveness. Assertiveness, querulousness and suspiciousness were fairly common. The paranoid trends which were observed by Bingley did not in any case merit the diagnosis of a paranoid psychosis, and were connected with perseverative qualities to a marked degree. They were regarded by Bingley as partial

symptoms of the full-blown epileptic personality change and not as a syndrome *sui generis*. Bingley adopted the term 'ixophrenic' to designate this type of personality change (cf. Gastaut *et al.*, 1955). However, he was anxious to stress that the term 'ixophrenic personality change' is not used in the sense of a hereditary personality type but denotes a mental syndrome which is caused by an operationally defined cerebral lesion (Bingley, 1958, pp. 125-6). However, as the term 'ixophrenia' is not common parlance in Britain, the term 'adhesiveness' used above is preferred as a description of this epileptic personality change.

It may be of interest to describe the personality changes Bingley found in the different groups of tumour-free cases. Of the 33 patients with bilateral shifting temporal foci, 22 (67 per cent) showed personality changes. The commonest type of personality change, occurring in 18 patients (55 per cent), was adhesiveness. Five of the patients in this group had earlier been admitted to a mental hospital because of mental disorders, but none showed any psychotic symptoms at the time of the examination. There was no evidence to indicate that any of the previous disturbances were caused by a typically schizophrenic psychosis or by a clear-cut schizoid psychopathy. In 3 of the 18 patients with adhesiveness, there was moderate emotional blunting, and in 2 of the remaining 4 patients, this trait was the most prominent mental symptom. Paranoid tendencies were noted in 10 patients with adhesiveness.

Bingley also found personality changes in 14 (58 per cent) of the 24 patients with a unilateral EEG focus in the dominant lobe. Thirteen (54 per cent) of these patients could be classified as adhesive. Five of the adhesive patients exhibited paranoid tendencies, but these were less intensive than in the group with bilateral foci. Of the patients in this group, 4 had earlier been admitted to a mental hospital because of mental disorder, but only one patient showed some emotional blunting.

Of the 17 patients with a unilateral EEG focus in the recessive lobe; 10 (59 per cent) showed personality changes. Of these, 8 (47 per cent) were adhesive and 2 were paranoid but not of marked degree.

If the above groups are compared as regards adhesiveness, there are no great differences, but if the complete adhesiveness syndrome, including paranoid features, is considered, a more prominent trend appears, with 30 per cent, 21 per cent and 12 per cent respectively. Moreover, all 5 patients with a pronounced adhesiveness syndrome belonged to the group with bilateral shifting temporal foci.

It should perhaps be stated in this context that the often vague definition of the terms temporal-lobe epilepsy and psychomotor epilepsy has created much confusion in this field. Bingley, however, is of the opinion that psychomotor epilepsy is only a clinical term, 'i.e. its definition should be based on clinical observation and be independent of electrophysiological or anatomical data' (Bingley, 1958, p. 11). He also excluded mental phenomena from his description of the clinical features of psychomotor attacks, which are characterized as 'masticatory seizures, automatic speech and automatic behaviour'. The psychomotor seizures were not associated with the laterality of the injury, but the incidence of these seizures was considerably greater in the tumour-free group (78 per cent) than in the tumour-bearing group (Bingley, 1958, p. 95). It will be of interest to mention that grand-mal seizures occurred in 85 per cent of the 74 non-tumour cases, but Bingley is of the opinion that there is no convincing evidence that the psychomotor seizures were secondary to grand-mal seizures (pp. 95-6).

Bingley's description of the complete adhesiveness syndrome *change* is similar to the characteristics of a syndrome of hypoactivity ('adhesiveness' associated with general slowness of motor and intellectual processes, emotional indifference or depression, explosiveness and aggressiveness) which Gastaut *et al.* (1955) found to be typical of 45 out of 60 non-institutionalized psychomotor epileptics. This syndrome also occurred in some cases of grand-mal with diffuse cerebral lesions. According to these authors, the syndrome of hypoactivity is correlated with an EEG showing slow alpha background activity (less than 9.5/sec.). But the occurrence of a temporal focus was not a necessary condition for the syndrome. In about 20 per cent of the psychomotor epileptics, the

authors found a syndrome of hyperactivity (general acceleration of motor and intellectual processes, emotional lability and more or less permanent irritability and impulsiveness). This syndrome was correlated with the EEG of fast alpha background activity (9.5-13/sec.) characteristic of idiopathic epilepsy. The Rorschach records of this group suggested an extratensive personality, while the typical psychomotor epileptics were more coarctative.

However, there are now recognized differences between the pure and the combined forms of psychomotor epilepsy; the latter is associated with unspecific symptoms of an organic character, together with psychotic episodes; the pure form is characterized by neurotic and psychotic reactions (cf. Janz, 1969, pp. 274-5). But, as far as I can see, Bingley (1958) and Gastaut *et al.* (1955) have only described important traits of the combined form (associated with grand-mal seizures) of psychomotor epilepsy.

In a Rorschach study by Delay *et al.* (1958) of psychomotor temporal and idiopathic epileptics, 68 per cent of the patients showed Piotrowski's organic signs, independently of aetiology and location. This fact suggested the presence of a basic dimension of an 'epileptic personality', common to all epileptics. This personality was mainly characterized by ideational perseveration, but the same personality trait is to be found in patients with organic symptoms in general and is not peculiar to epilepsy. Apart from this organic dimension, Delay *et al.* (1958) encountered a second dimension with two opposite poles. Around one pole were distributed psychomotor temporal epileptics with a strongly extratensive personality, characterized by excessive emotional reactivity of the impulsive and explosive type. Around the other pole of the second dimension, idiopathic epileptics were distributed. These epileptics had a coarctative personality, with more restrained emotional reactivity. But these results are contrary to the extratensive Rorschach records which Gastaut *et al.* (1955) obtained for the idiopathic epilepsy group. However, the epileptic groups in the investigation of Delay *et al.* (1958) were selected by less well-defined criteria, while the results of the Rorschach study reported by Gastaut *et al.* (1955) on idiopathic epileptics are corroborated

by Leder (1967), as regards idiopathic 'Aufwach' epileptics with emotional lability. It is also very interesting that another idiopathic group of 'Schlaf' epileptics produced similar Rorschach records, suggesting the same type of coarctative personality as a group of patients with psychomotor seizures. These results may possibly explain certain parts of the inconsistent reports by Delay *et al.* (1958) and Gaustaut *et al.* (1955).

#### MMPI PROFILES FOR CERTAIN GROUPS WITH PSYCHOMOTOR EPILEPSY

Although Bingley (1958, p. 128) asserts that there is no quantitative method of measuring the emotional changes arising in the temporal lobe which he tried to assess subjectively, Meier and French (1965a) report the results of a pre-operative investigation, using the MMPI test on groups of patients with psychomotor seizures that were poorly controlled by anti-convulsant medication. This test offers a means of arriving at a quantitative evaluation which was not mentioned in Tizard's critical survey (1962).

For a group of psychomotor epileptics ( $N = 20$ ) with unilateral temporal-lobe EEG abnormalities, Meier and French obtained a profile of the 9-8 type, with the 9 (Hypomania) and 8 (Schizophrenia) scales at 60  $T$  points, suggesting a weak tendency to hyperactive reactions, according to the description given by Dahlström *et al.* (1972, pp. 285-6). In comparison with this group, psychomotor epileptic patients ( $N = 33$ ), with bilateral temporal-lobe EEG abnormalities and a profile of the 8 (2-7-1-6) type with the 8 scale over 70  $T$  points and the other scales somewhat over 60  $T$  points, showed significantly higher  $T$  points for the scales 8 (Schizophrenia), 2 (Depression) and 6 (Paranoia). According to Meier and French, these scales (but not the scales 7 (Psychasthenia) and 1 (Hypochondriasis)) are validated against psychiatric criteria incorporating schizo-adaptive and depressive behavioural characteristics. The MMPI profile of the patients with bilateral temporal-lobe EEG abnormalities is, however, not wholly suitable for a comparison with the marked traits of the complete adhesiveness syndrome and the less frequent atypical schizophrenic symptomatology

which Bingley (1958) reported for a group of temporal-lobe epileptics with bilateral shifting temporal foci.

The most equivalent comparison group is, instead, the bitemporal independent EEG spike-foci group, one of two sub-groups which Meier and French obtained from the group of patients with bilateral temporal-lobe EEG abnormalities. The subgroup of psychomotor epileptics with bitemporal independent spike foci ( $N = 22$ ) is characterized by a profile of the 8 (2-4-6-7-9) type with the 8 scale over 70  $T$  points and almost all other scale values just under 70  $T$  points. This profile reflects paranoid traits fairly well, according to the description by Gilberstadt and Duker (1965, pp. 76-9) of the somewhat higher profile of the 8-2-4 (Schizophrenia-Depression-Psychopathic Deviate) type at 80-90  $T$  points, and also to a certain degree schizo-adaptive and depressive behavioural characteristics, according to the interpretation given by Meier and French for the scales 8, 2 and 6.

It is also of interest to note that the mean values of the MMPI scales 2, 4, 6 and 7 of psychomotor epileptics with bitemporal independent EEG spike foci were significantly greater ( $p < 0.01$ ) than the corresponding scale mean values of the remaining comparison group ( $N = 11$ ) of psychomotor epileptics with bitemporal abnormality, single spike focus. Of the above-mentioned scales, scale 7 is of particular interest. This scale was derived to evaluate the neurotic pattern of psychasthenia or the obsessive-compulsive syndrome. In addition to this syndrome there are also some forms of abnormal fears, worrying and difficulties in concentration measured by the scale 7. Furthermore, scale 9 (Hypomania) is also of a certain interest in this connection, but the mean value of this scale is not as high as the mean values of scales 2, 4, 6 and 7. Therefore the indications on scales 2 and 9 may, according to Gilberstadt and Duker (1965, pp. 45-6), only be interpreted as signs of the presence of a certain amount of explosive reactions. In a study concerning a detailed comparison of two alcoholic groups (as yet unpublished), the author has interpreted scales 6 and 9 as measuring aggressive paranoid reactions, but the indica-

tions on scales 6 and 9 in the above profile type may only be interpreted as a weak tendency to these reactions.

I have found the meaning of scales 8, 2 and 4, the meaning of scale 7, the meaning of scales 6 and 9 and the meaning of scales 2 and 9 in the 8 (2-4-6-7-9) profile of the group of psychomotor epileptics with bitemporal independent EEG spike foci, approximately in accordance with the description which Bingley (1958, pp. 125-6) has given of the complete adhesiveness syndrome in patients suffering from temporal-lobe epilepsy and particularly in patients with bilateral shifting temporal foci. The description of this complex syndrome with perseverative and other associated traits also includes paranoid trends. It may be observed that these paranoid trends are not a syndrome *sui generis* but partial symptoms of the epileptic personality change (c.f. the almost equally high MMPI values of the 7 scale and the 8-2-4 type configuration at about 70 *T* points). Besides, the description of the complete adhesiveness syndrome is coloured by emotional changes in the form of assertiveness, querulousness, dysphoria and irritability, and sometimes also by explosiveness.

It is therefore very possible that the MMPI measurement at about 70 *T* points for the sub-group of psychomotor epileptics with bitemporal independent EEG spike foci really measures the complete adhesiveness syndrome, besides the schizo-adaptive and depressive reactions suggested by Meier and French. It may be observed that the presence of bitemporal independent EEG abnormalities was associated with not only the highest MMPI scale elevations before operation but also with the greatest scale reductions (significant changes) *after operation* (Meier and French, 1965b). These data strongly suggest that there is a direct causal relationship between temporal lobectomy and post-operative personality change. Although such a conclusion, according to Meier and French, should be qualified by a consideration of environmental and non-surgical influences not subject to precise control in the clinical setting, it also suggests that the mental disturbances associated with the presence of bitemporal independent EEG abnormalities

were not caused by anti-convulsant medication.

As has already been mentioned, there are now recognized differences between the pure and the combined forms of psychomotor epilepsy. As the pure form is characterized by neurotic and psychotic reactions and the combined form by more unspecific symptoms of an organic character and psychotic episodes (Janz, 1969, pp. 274-5), the MMPI measurement for Meier and French's (1965a) bitemporal independent EEG spike-foci group may be regarded as a measurement of personality disturbances for the combined form of psychomotor epilepsy. It may also be pointed out that Meier and French thought that this group might involve the major epileptogenic correlate of personality disturbances among psychomotor epileptics. These personality traits have now been more carefully described in the present study and are therefore suitable for studying the problem, suggested in the introduction, of differentiating adequately defined personality traits of epileptics from explosive aggressive reactions caused by chronic alcoholism.

#### THE MEASUREMENT OF EXPLOSIVE AGGRESSIVITY

According to Gilberstadt and Duker (1965, pp. 44-7), the MMPI profile of the 1-3-9 (Hypochondriasis-Hysteria-Hypomania) type at 70 *T* points, like the 2-9 (Depression-Hypomania) type reported by Hathaway and Meehl (1951), seems to be associated with a high frequency of organic brain dysfunction. The patient with this dysfunction is characterized by explosive reactions, especially after drinking alcoholic beverages, by great irritability and stormy interpersonal relationships and sometimes by acts of violence that are often quite unmotivated. This description is similar to the characteristics of emotional lability, with explosive fits of frenzy, hypomania and depression, which Langfeldt (1959, pp. 104-5) reported as arising from injury to the frontal lobe, or to the affective disorders of irritability, aggression, depression and euphoria which Lishman (1968, d p. 404) found to be characteristic of frontal wounds. Although Petrilowitsch (1964, p. 87) considers that explosive traits may colour different personality types, for instance, fana-



tical and hysterical personalities, he is also of the opinion that it is possible to distinguish a more homogeneous explosive personality type. These personalities mostly showed a hyperthymic temperament. It may also be mentioned that explosive aggression was recently accepted in the revision of the International Classification of Diseases (WHO, 1967, p. 148) and designated as 301.3. Explosive. Aggressive personality. The above MMPI measurements of the 1-3-9 and the 2-9 types may therefore be considered suitable as measurements of explosive aggressive reactions of the organic brain dysfunction.

THE PROBLEM OF DIFFERENTIATING THE  
PERSONALITY IN A CERTAIN FORM OF  
PSYCHOMOTOR EPILEPSY FROM THE EXPLOSIVE  
AGGRESSIVITY CAUSED BY CHRONIC  
ALCOHOLISM

This problem is illustrated by Fig. 1, which shows the MMPI measurement Meier and French (1965a) reported for the bitemporal independent EEG spike foci group and an MMPI profile for a patient with explosive

aggressivity from an investigation at Östfora Institution, outside Uppsala. The following case history describes this patient.

#### CASE HISTORY

A 35-year-old unmarried, unskilled labourer from a good home with good job prospects was too restless to stay at any place of work for more than a short period. His drinking of spirits—for a reason which he cannot explain—began when he was 16 years old and gradually increased to such an extent that pathological changes have taken place, of which he is very well aware.

The patient is, as a rule, quiet and good-natured. But after consuming only a small quantity of spirits he has in recent years become more and more noisy, and is prone to get involved in violent arguments with his drinking companions. The patient has on several occasions had fits of rage, come to blows, and reached the stage when he smashes everything. The patient is often in low spirits and his judgement, intelligence and memory have deteriorated with the years.

#### Diagnosis

Explosive. Aggressive personality, in accordance

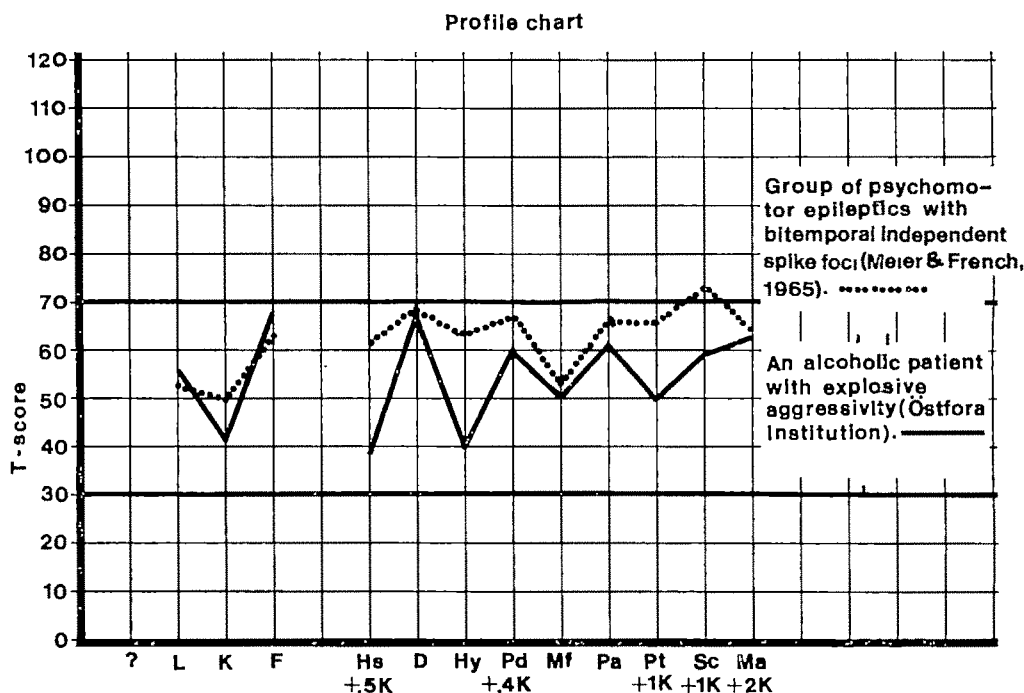


FIG. 1.—Profiles showing the results for a psychomotor group and an alcoholic patient with explosive aggressivity.

with the above-mentioned criteria for explosive aggressivity.

#### DISCUSSION

The curve profile in Fig. 1 for this severely injured alcoholic patient with explosive aggressivity is characterized by elevations of the scales 2 (Depression) and 9 (Hypomanic reactions) just under 70 *T* points and the other scales at or under 60 *T* points. This profile is in quite good agreement with the above reported 2-9 type profile for explosive aggressive reactions of the organic brain dysfunction. It is interesting to note the coincidence of the values for scales 2 and 9 in both profiles. But the explosive aggressive reactions suggested by the scales 2 and 9 in the profile of psychomotor epileptics may only be regarded as partial symptoms of the complete adhesiveness syndrome, according to the analysis carried out in the previous section of the present article of a more complex configuration of almost equally high MMPI scale values, interpreted as measuring this syndrome. The main part of the syndrome with paranoid and perseverative symptoms is, together with a tendency to schizo-adaptive reactions, not characteristic of the alcoholic patient with explosive aggressive reactions. In any case, the above comparison suggests that the MMPI test offers a means of arriving at a differentiation of the personality changes of a markedly aggressive nature caused by chronic alcoholism from the main part of some defined personality changes in one important form of psychomotor epilepsy.

Johnson (1969, p. 51), who has recently described several cases of explosive aggressivity, is inclined to attribute the fits of frenzy found in brain-damaged persons after alcoholic poisoning to changes in the septum pellucidum. Johnson reports that in these explosive psychopaths 'disruption of the septum pellucidum had been demonstrated by air encephalography'. The occurrence of rage reactions caused by lesions in the septum pellucidum is corroborated by Smythies (1970, p. 79). In this connection, it may also be mentioned that Haug (1968, p. 142) reported that alcoholic deterioration was related to an enlarged third ventricle. Such results suggest that brain damage in chronic

alcoholics may be related not only to the dorsolateral parts of the frontal lobes (cf. Courville, 1955) but also to the subcortical areas of the brain.

It may be of interest to compare the neurological location of the brain injuries which are probably the precondition for the occurrence of explosive aggressivity with that of those which cause the personality changes which Meier and French (1965a) reported for psychomotor epilepsy. We may get an idea of the location of the injuries which gave rise to the latter personality changes if we consider what Meier and French (1965a, p. 4) have to say on the subject of operations on patients in this category:

After confirmation of a well-delineated circumscribed temporal lobe focus was established, resection of that portion of the temporal lobe was performed in an *en bloc* fashion . . . Resection was carried perpendicular to the surface of the brain, through the lateral ventricle and then through the hippocampus to the medial aspect of the lobe with the insula being exposed *in toto*. The free edge of the tentorium was visualized. Attempts were made to keep the character of the excision relatively constant from patient to patient. In most instances the posterior margin of the resection was 7 to 9 centimetres from the tip of the temporal lobe. Electrodes were then re-applied and electrographic recordings made along the margin of the excised area. When necessary, further excision was made until no electrical abnormalities were evident.

#### SUMMARY

The diagnosis of the alcoholic personality poses the special problem of differentiating the explosive aggressivity provoked by chronic alcoholism from the personality of certain epileptics.

The theoretical passages in the previous section of the study relate to a critical survey of the evidence of the epileptic personality and to a comparison of some relevant studies for the selection of a psychometric measurement of adequately defined personality changes for one form of psychomotor epilepsy.

The above-mentioned diagnostic problem is then illustrated by a comparison of the MMPI profile of a sub-group of psychomotor epileptics with bitemporal independent EEG spike foci,

which may provide the major epileptogenic correlate of personality disturbances among psychomotor epileptics, with the MMPI profile for a patient with explosive aggressivity caused by chronic alcoholism.

It is interesting to note the coincidence of the values for scales D and Ma in both profiles. The profile for the alcoholic patient is characterized solely by the values of these scales which measure explosive and aggressive reactions. However, the reactions suggested by these scale values in the profile of psychomotor epileptics may only be regarded as partial symptoms of the complete adhesiveness syndrome, according to an analysis of a more complex configuration of almost equally high MMPI scale values, interpreted as measuring this syndrome. The main part of the syndrome with paranoid and perseverative symptoms is, together with the tendency to schizo-adaptive reactions, not characteristic of the alcoholic patient.

The results suggest that the MMPI test offers a means of arriving at a differentiation of the explosive aggressivity caused by chronic alcoholism from the main part of some defined personality changes in one important form of psychomotor epilepsy.

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## Socio-Clinical Substrates of Folie à Deux

By SOM D. SONI and G. JOSEPH ROCKLEY

Folie à deux, the psychosis of association, has been defined as 'the transference of delusional ideas and/or abnormal behaviour from one person to one or more individuals who have been in close association with the primary affected person' (8). At least three conditions have been regarded as pre-requisite for its diagnosis: (a) definite evidence that the partners have been intimately associated, (b) identical content of the delusional ideas in both the patients, and (c) unequivocal evidence that the partners share, support and accept each other's delusions (7).

In most cases of folie à deux one person (the dominant partner or the *Principal*) initiates the delusions and the other (the submissive partner or the *Associate*) acquires them secondarily. There have been only a few cases reported in the literature where it has not been possible to identify these (16, 23).

Despite its rarity, folie à deux has been the subject of a considerable number of publications since it was first described by Lasègue and Falret in 1877 (15). A detailed review of the literature on the subject by Gralnick (8) revealed a total of 103 cases reported between 1877 and 1942. He listed four types of folie à deux described by workers up to his time: (a) folie imposée, in which delusions of a psychiatric person are transferred to a mentally sound one; (b) folie simultanée, where two or more people become psychotic simultaneously and share the same delusion; (c) folie communiquée, in which there is a contagion of ideas after the sound person has resisted them for a long time, but having acquired them maintains them despite separation; and (d) folie induite, where the delusions of one are added to those of another. Only a handful of papers on folie à deux, mostly case reports, have appeared since Gralnick's excellent review, and these have added little to our knowledge of the subject.

Much has been written about the relative

aetiological importance of morbid hereditary predisposition and the environment, and although a number of explanations of the mechanism(s) involved in and/or the circumstances favouring the development of folie à deux have been suggested, none of them appears to explain all aspects of the syndrome. In this paper we report eight cases of folie à deux seen at Prestwich Hospital between 1962 and 1973, and, based on the findings of our study, we suggest a socio-clinical approach to these disorders.

### CASE REPORTS

#### Case 1

Margaret was referred with complaints that her neighbour had been spying and trying to blind her. Not only her mother (Mary) but also her grandmother (Elizabeth) had been treated for identical complaints.

Elizabeth (then aged 89) was admitted in 1964 with the above delusions, which persisted, despite treatment with ECT and phenothiazines, until she died in hospital seven months later.

Mary (now aged 70) returned to live with Elizabeth after the death of her own husband in 1943. In 1964 she was found to share her mother's delusions and was admitted, treated and discharged. She has since had several relapses and readmissions, the latest in 1973, when she had identical delusions with those of her eldest daughter Margaret.

Margaret (aged 44) had always been regarded by her brothers as 'slightly queer' and solitary, but she worked until 1972. At this time she became progressively more withdrawn, and she was admitted with her mother in 1973. She appeared perplexed and had difficulty in concentration, in addition to the shared delusions. She could also hear voices accusing her of sexual misbehaviour. She was treated with ECT and phenothiazines and has shown some improvement.

*Comment.* Heredity must have played a prominent part in this case, in which all three patients were undoubtedly schizophrenic when they acquired their delusions. Presumably the schizophrenic process

already present in the subjects had prepared the ground on which these delusional systems could be acquired by each new associate. Despite treatment none of the patients totally lost their delusions.

Although Margaret was living in the same house when Mary and her mother were admitted to hospital, she did not acquire the delusions until 1973. Perhaps her schizophrenic process was not advanced enough to allow their development earlier. No other case of this type could be found in the literature where a delusional system had been transmitted through three generations.

David (aged 18) (Margaret's nephew) has been living in the same house for eight years but shows no morbid features. Perhaps he does not share his relatives' predisposition to schizophrenia.

#### Case 2

Mabel (aged 52) and her widowed mother Margaret (aged 83) were admitted at the same time in 1968 with a common delusional system of persecution by a neighbour. Margaret had been deaf for ten years, and had created trouble locally because of her delusions.

Mabel had always lived with her mother, and was a quiet, socially aloof person. At the age of 54 she had had bilateral mastectomy for suspected malignancy. Some years before admission she had given up her job.

It was not possible to determine who first developed the delusions, Mabel appeared to be more firm in her beliefs, but Margaret had a very dominant personality. They were both treated with phenothiazines and showed some improvement. They were rehoused, but their delusions reappeared, this time directed against their new neighbours. In 1970 they were readmitted, Margaret later dying of bronchopneumonia. Mabel is still receiving out-patient treatment.

#### Case 3

Renée (aged 47) and her mother Annie (aged 76) were simultaneously admitted to this hospital in 1967 with shared well-systematized delusions of persecution relating to the Army. They would not leave their home, which was due for demolition, and wore polythene 'protective' clothes because they thought they were being attacked by 'rays'.

Annie married at the age of 21; her husband, who was rigid and often brutal towards the children (four in all), died in 1946, and all the children except Renée, the youngest, married and moved away from the house. For some time before her admission Annie had been losing her hearing, and she had been deluded since at least 1960.

Renée was described as always being 'peculiar', and her delusions were first noticed as early as 1947, but her mother had persistently refused psychiatric help. On admission Renée was grossly deluded and hallucinated with a total lack of insight. Both mother and daughter were treated with phenothiazines and ECT. Annie was also given a hearing aid, improved and discharged; Renée's symptoms were only slightly alleviated, but she was eventually discharged.

*Comment.* In Case 2, it is difficult to determine who initiated the delusions, but in Case 3 there is no doubt that the daughter did. In both these cases the associates were found to be suffering from a paraphrenic illness which formed the substrate for acquiring the delusions. Partial deafness was a contributing factor in both these cases; it allows scope for misinterpreting spoken words, and therefore may predispose the subject to develop delusions. In his study Chapman suggested that the origin of a delusion may be traced to a disturbance of perception and cognition (3), and a high proportion of elderly paraphrenics show deafness (17). Of course not all deaf individuals become paranoid, and possibly those whose characteristic ego-defences are denial and/or projection are more likely to do so when they lose their hearing. An analogous condition is seen in linguistically isolated aliens (2, 13), and a case of folie à deux in two Polish immigrants with an imperfect command of English has also been reported (7).

#### Case 4

Mildred (aged 39) and William (aged 37), married for 15 years, were admitted together in 1973, with a history that both of them had for the past few months shared delusions of persecution by police and neighbours.

Mildred had always been relatively aloof. Six months before admission she developed the delusions after a dream. At interview she appeared suspicious, reticent and perplexed, and rapport was difficult to establish. She was treated with phenothiazines and ECT but still shows evidence of schizophrenic thinking.

William, whose mother was liable to repeated bouts of 'agitated depression', was enuretic until the age of six, a shy but happy child who tended to be rather dependent on his mother. About five months before admission he had started drinking in excess because of 'problems in the family'. Initially he felt that he could only believe in his wife's delusions after he had had a few drinks, but latterly he had totally agreed with them even when not under the influence of alcohol. At interview he appeared to be a warmer person, and rapport was easily established. He had

partial insight into the delusions. Three days after admission he lost all his delusional beliefs. Their three children were psychiatrically normal.

*Comment.* This case shows how a relatively dependent person may develop a paranoid reaction and come to believe and identify with a schizophrenic partner's delusions. It is known that the onset of paranoid delusions is more likely in states of impaired or altered perception (3), and we therefore believe that William's drinking may have been involved as a precipitating factor in addition to his predisposing personality.

#### Case 5

May (aged 46) was admitted in 1968. Both she and her son Clifford (aged 14) had a common delusional system relating to persecution by a former neighbour.

May married at the age of 28, but the marriage ended in divorce. Her former husband said she had always been very suspicious and solitary, and there had been very little 'conversation or sex' within the marriage. Her present symptoms started insidiously in 1960. At interview she was found to be very suspicious and uncooperative; she held her delusions with considerable emotional force and admitted hearing voices. She was treated with phenothiazines and ECT and gradually improved.

Clifford was very close to his mother. He started sharing his mother's delusions at least one year before May's admission. At interview he was quite cooperative and referred with undue reverence to his mother. He showed no other psychotic features, and his delusions were not held with any degree of tenacity; after May's admission he rapidly lost them without treatment.

*Comments.* In this case May undoubtedly was the principal, having initiated the delusions as a part of a schizophrenic process, and Clifford, young and dependent as he was, either could not resist acquiring them or could not bear to have his image of his mother shaken by the thought that she might be insane. In the absence of his father, Clifford had no one except his mother to lean on, and it can be conjectured that if the father had stayed in the house Clifford would never have become deluded. Younger children tend to be highly suggestible (10); and it appears that in Clifford's case this factor, as well as the relative dependence on his mother, in a setting of almost total social isolation, determined the onset of folie à deux.

#### Case 6

Edna (aged 69) and her daughter Yvonne (aged 27) were admitted in 1973, both being convinced that the former's husband, who had died 20 years earlier

at sea, was coming home, and that in his absence the neighbours were threatening to break down their house, abetted by social workers.

Edna did poorly at school; she married at the age of 18, and had 12 children, all except the youngest, Yvonne, having since left home. In 1969 their house was scheduled for demolition, and it was then that Edna was first treated for 'paraphrenia'. After discharge she continued to isolate herself and her daughter and refused all attempts at rehousing. When readmitted she was very hostile, suspicious and uncooperative. She was of dull intelligence, showed over-inclusiveness and florid delusions, and admitted to hearing voices. Despite treatment with phenothiazines, she remains very deluded.

Yvonne was always 'backward' and solitary. On examination she was found to be of diminutive and slender build (height 130 cm., weight 35 kg.). She shared her mother's delusions and was educationally subnormal. She was admitted to a hostel and quickly lost all her delusions without specific therapy.

#### Case 7

Two spinster sisters, Annie (aged 76) and Norah (aged 64) twice developed folie à deux. Annie, who was deaf, developed olfactory and auditory hallucinations in 1956, and believed she was being persecuted by a neighbour. In 1959 she was found to have macrocytic anaemia (? steatorrhoea), and she has since been treated continuously with folic acid and later with hydroxycobalamine. She apparently responded to phenothiazines in 1962, but in 1973 she again developed delusions of persecution and hallucinations, this time olfactory and visual. She had a dominant personality, holding her delusions with considerable emotional force. Out-patient treatment with phenothiazines was recommended, admission not being thought justified.

Norah had always been 'backward' and her sister had looked after her nearly all her life. In 1962 she was found to be sharing Annie's delusions and hallucinations, and again 1973 about a month after the onset of her sister's relapse, she developed a 'carbon copy' of Annie's new symptoms.

*Comment.* In Case 6 Edna was the principal. It had been stressed that superiority in intelligence and education assist the principal to dominate and transfer delusions to the associate (5, 7, 22). Although in this case neither of these factors was prominent, Yvonne's identification of her mother with authority, and her relative suggestibility because of low intellectual endowment (5), together with enforced social isolation, may all have aided in the transference of delusions. In Case 7 Annie was the principal, and her paraphrenic illness may have been pathogenetic-

ally related to her megaloblastic anaemia. The importance of subnormality in the transference of delusions was again significant.

#### Case 8

Joseph (an Eireann, aged 51) was apparently happily married until his wife left him in 1968. In 1971 he was treated for 'paranoid schizophrenia', but after discharge he continued to deteriorate and in 1973 was readmitted complaining that his neighbours were ignoring him because of his Roman Catholicism. He was ill-kempt and querulous. His delusions were soon overshadowed by marked emotional lability, loquaciousness, forgetfulness and a total lack of insight. He rapidly worsened, lost weight and developed epileptiform fits. The diagnosis of severe progressive dementia was by now obvious.

Michael (aged 27), Joseph's only son, was admitted in 1967, with delusions relating to persecution by neighbours because of his religion. He appeared perplexed and felt that he could not think properly. His affect was incongruous, and he had little insight. He was treated with phenothiazines and ECT, but is still deluded and has since been readmitted several times.

*Comment.* In this case Michael was the principal, having first developed the delusions as a part of his schizophrenic illness. Joseph, on the other hand, had been well until two years before his admission, when he started to share his son's delusions. Since paranoid symptoms are not uncommon in the early stages of dementia (17) it appears that in this case Joseph's delusions may have been acquired on the basis of his own morbid dementing process. This case also shows how culture can be an important determinant of the content of delusions, as evidenced by the prominence attached to religion, probably because of a staunch Catholic upbringing.

#### DISCUSSION

The comments made on the cases show that: (a) the delusions shown by each pair were identical although the firmness with which they were held varied; (b) most cases showed a degree of social isolation, although this was less prominent in some (Cases 4, 7 and 8); (c) in all cases the principal was suffering from a schizophrenic illness, a finding which with a few exceptions (Table I) is consistently seen throughout the literature; (d) the associates in the cases described did not have a clinical uniformity; a variety of factors appeared to have facilitated the transference of delusions;

TABLE I  
*Selective review of literature on folie à deux\**

|                                           |    |    |    |    |
|-------------------------------------------|----|----|----|----|
| <i>Principal</i>                          |    |    |    |    |
| Schizophrenia                             | .. | .. | .. | 65 |
| Paraphrenia                               | .. | .. | .. | 31 |
| Affective psychosis                       | .. | .. | .. | 9  |
| Senile arteriopathic psychosis            | .. | .. | .. | 4  |
| <i>Associate</i>                          |    |    |    |    |
| Personality disorder†                     |    |    |    |    |
| (a) Marked dependency                     | .. | 11 | }  | 18 |
| (b) Hysterical features                   | .. | 4  |    |    |
| (c) Paranoid personality                  | .. | 3  |    |    |
| Schizophrenia                             | .. | .. | .. | 40 |
| Paraphrenia§                              | .. | .. | .. | 20 |
| Drug-induced psychosis (schizophreniform) | .. | .. | .. | 2  |
| Affective psychosis                       | .. | .. | .. | 4  |
| Senile dementia                           | .. | .. | .. | 2  |
| Pre-senile dementia                       | .. | .. | .. | 2  |
| Arteriosclerotic dementia                 | .. | .. | .. | 3  |
| Mental subnormality                       | .. | .. | .. | 5  |
| Physical disabilities                     |    |    |    |    |
| (a) Partial deafness§                     | .. | 19 | }  | 25 |
| (b) Strokes (CVA)                         | .. | 4  |    |    |
| (c) Alcohol indulgence                    | .. | 2  |    |    |
| Language barriers                         | .. | .. | .. | 2  |

\* We traced 163 cases in the literature but only 109 cases (including the present series) contained adequate information relevant to this table.

† In the absence of other psychiatric diagnosis.

§ These groups overlap in many cases.

(e) most of the cases showed a relationship between the immediate environment and the content of the delusional system.

The relative importance of the personality (7, 22), heredity (1, 6, 11, 12, 18, 19) and the environment (9, 13, 14) is far from settled. The principal in almost all cases is a schizophrenic, although affective psychosis (4, 20), drug induced psychosis (21), and senile arteriopathic psychosis (7), are also recorded. Few people in close association with deluded individuals acquire their delusions, as attested by the rarity of folie à deux. There must, therefore, be some abnormalities of the associate either in his genetic make up, personality, social milieu, or all these, which predispose him to acquire the principal's delusions. A review of the literature in conjunction with the present study revealed a number of these (Table I). We feel that since the schizophrenic illness of an associate is no



different from schizophrenia in any other situation, it is reasonable to assume that *hereditary factors* are basically the same as in schizophrenia occurring in the general population.

In some cases it is obvious that the transference of delusions has taken place on the basis of the associate's abnormal *personality*; common predisposing traits include seclusiveness, suggestibility or dependence on the principal. The characteristic ego-defences of the associate as applied to the stress of the (loved and/or admired?) principal's illness also appear to be relevant. It can be conjectured that those who react with hostility, refusal, isolation, repression or rejection would not be as likely to accept the principal's delusions as those who rationalize and identify with their partner, thus reducing their own anxiety. The importance of the *social milieu* lies not only in the content of the delusions, but also in that it contains the principal and associate. In all cases in the present series the delusions appeared to have some connection with the immediate environment. Cultural factors are also involved in shaping the content of delusions (cf. Case 8).

Many schizophrenics live in intimate association with a dependent person or even with another schizophrenic and yet no sharing of delusions takes place. In such cases the timing of the onset and the presence or absence of precipitating and predisposing factors may be of importance. Our Cases 1 and 4, and the onset of folie à deux after emotional shock (4) or after methylphenidate (21), support the significance of these factors in determining the onset of shared delusions.

Finally, the above observations suggest the importance of the socio-clinical substrates which provide the soil for the sharing of delusions. This is of prognostic as well as therapeutic significance. When the associate becomes deluded in a setting of an abnormal personality the prognosis is generally good, and mere separation of partners is sufficient for him to lose his delusions. When, however, folie à deux has arisen in a substrate of a morbid endogenous psychosis (e.g. schizophrenia, depression), the prognosis appears to depend on the underlying illness, and appropriate therapy is indicated.

#### SUMMARY AND CONCLUSIONS

Eight cases of folie à deux seen at Prestwich Hospital are presented in this paper. A relevant review of the literature in conjunction with these cases suggests that whereas the principal in folie à deux is always a psychotic who initiates the delusions on the basis of his morbid psychotic illness, the associates have an assortment of abnormalities including schizophrenia, subnormality, susceptible personality and dementia which predispose them to acquire the delusions of their partners. The social milieu is considered as a determinant of the actual content of the delusional systems, and precipitant in some cases. It is the opinion of the authors that such a socio-clinical approach in folie à deux can be rewarding both prognostically and therapeutically.

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## Electroencephalographic Examination in the XYY Syndrome and in Klinefelter's Syndrome

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Previous electroencephalographic studies of persons with sex chromosome aberrations have indicated that there might be more electroencephalographic aberrations in males with double Y and double X than in the general population. A survey of these studies has recently been made by Fenton *et al.* (1971).

We have made electroencephalographic studies of 25 males with the XYY syndrome and 59 with Klinefelter's syndrome (Table I). Abnormal EEG was found in 8 of the 25 XYY males (32 per cent), compared with 11 of the 59 males with Klinefelter's syndrome (19 per cent). Four males (two with karyotype 47,XXY and two with 47,XYY) showed specific EEG abnormalities. A high amount of theta waves in basic rhythm was found in 8 of the 25 males with the XYY syndrome (32 per cent) and in 10 of the 59 males with Klinefelter's syndrome (17 per cent).

Pneumo-encephalogram or ventriculogram was made in three XYY males, one had cortical and central atrophy, the second had asymmetrical dilatation of the ventricular system, and the

third had a normal pneumo-encephalogram. Four of the 11 males with Klinefelter's syndrome examined with air encephalogram or ventriculogram had dilatation of the ventricular system.

None of the 25 males with the XYY syndrome had suffered from epilepsy. Three of the 59 with Klinefelter's syndrome (5 per cent) had suffered from epilepsy, but one of them only during childhood, and 6 (10 per cent) had suffered from conversional hysterical fits.

The results of the present study do not indicate that there is any increase in the frequency of epilepsy among males with double Y or double X, but there is evidence of an increased frequency of electroencephalographic aberrations in XYY males as well as in males with Klinefelter's syndrome; abnormal+border-line EEG was found in 44 per cent and 37 per cent in these two groups respectively, compared with the expected 12-15 per cent in the general population. It is seen in Table I that the frequency of EEG aberrations was as frequent in males outside institutions as in those in institutions.

TABLE I  
*EEG in males with XYY syndrome and Klinefelter's syndrome*

|                               |  |  |  |  |  |  |  |  |  | EEG      |    |             |    |        |    |       |
|-------------------------------|--|--|--|--|--|--|--|--|--|----------|----|-------------|----|--------|----|-------|
| Investigation                 |  |  |  |  |  |  |  |  |  | Abnormal |    | Border-line |    | Normal |    | Total |
|                               |  |  |  |  |  |  |  |  |  | Total    | %  | Total       | %  | Total  | %  |       |
| <i>XYY syndrome</i>           |  |  |  |  |  |  |  |  |  |          |    |             |    |        |    |       |
| In institutions .. .. .       |  |  |  |  |  |  |  |  |  | 4        | 32 | 3           | 12 | 9      | 56 | 16    |
| Outside institutions .. .. .  |  |  |  |  |  |  |  |  |  | 4        |    | —           |    | 5      |    | 9     |
| <i>Klinefelter's syndrome</i> |  |  |  |  |  |  |  |  |  |          |    |             |    |        |    |       |
| In institutions .. .. .       |  |  |  |  |  |  |  |  |  | 9        | 19 | 8           | 19 | 31     | 63 | 48    |
| Outside institutions .. .. .  |  |  |  |  |  |  |  |  |  | 2        |    | 3           |    | 6      |    | 11    |



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A consistent finding in the abnormal EEG is the high amount of theta activity and slow basic activity; this is common in children, as described among others by Petersén and Eeg-Olofsson (1971).

For further analysis of basic EEG rhythm in males with the XYY syndrome and Klinefelter's syndrome the quantitative and qualitative method will be needed, preferably of such males

ascertained from studies in the general population.

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## Chromosome Aberrations and LSD

### A Controlled Study in 50 Psychiatric Patients

By J. T. ROBINSON, R. G. CHITHAM, R. M. GREENWOOD and J. W. TAYLOR

While the beneficial effect of lysergic acid diethylamide (LSD) in the treatment of carefully selected patients as an adjunct to psychotherapy has been amply reported (Robinson *et al.*, 1963), concern has been expressed regarding the damage to chromosomes in those taking the drug.

This paper presents the results of chromosome studies in 50 psychiatric patients treated at Roffey Park Hospital, Horsham, with LSD in varying doses and for different periods and in 50 controls matched as far as possible for age, sex and marital status. Controls were all either members of the administration and nursing staff or students attending Roffey Park Hospital. A minor difficulty in matching for sex presented itself: patients were drawn from a wide geographical area and either could not be traced or felt unable to make the journey to Roffey Park Hospital where samples of blood were taken. This produced a difference in sex ratio in that there were more males amongst the patients than amongst the controls.

Patients had been treated with LSD weekly in a quiet semi-darkened room by intramuscular injection under strict medical and nursing supervision. The initial dose was 50 mcgms. of LSD, increasing weekly by 50 mcgms.; the maximum weekly dose given to any individual patients was 400 mcgms.

Each session was terminated after four hours by a combination of chlorpromazine 75 mgms. and Tuinal 100 mgms. For some patients further sedation with these drugs was required in the evening after treatment. The length of weekly treatment varied for each patient, but all treatment had been completed before blood samples were collected.

In all our cases treated with LSD, including those in this project, follow-up studies were carried out at 3, 6 and 12 months to assess patients' clinical condition, both mental and physical after treatment. These follow-up studies were carried out by questionnaires sent to the patients, the patients' close relatives and the patients' family doctors. These last had received full reports of the patients' clinical condition and treatment programme while in hospital. The patients were also seen at out-patient follow-up clinics at the Roffey Park and at the West London Hospital.

In no case was there evidence of any undesirable clinical effects following treatment.

The patients in this study came from London, the Home Counties and the Midlands, and were those who had received LSD in the years 1969 and later; some 80 patients in all were invited to volunteer. Eight patients had gone abroad, of whom five were married women under 30; three other women were engaged to be married and 'wanted to forget' their previous illness and treatment and so did not wish to participate in the study. Another 15, including 6 women, gave samples but unfortunately the cultures died because of the cutting off of electricity to the incubator during a strike, and these patients could not be persuaded to come a second time. Four requests to attend were unanswered. This left the remaining 50, and no patient was excluded for any other reason, so that there was no possible bias in the selection of patients.

The first blood samples were taken on 3 November 1970 and the last on 28 July 1972. The mean interval between finishing treatment and the taking of blood for chromosome analysis was three years and one month.

## METHOD

From each person 10 ml. of blood was drawn into a disposable syringe and transferred into an Evans heparinized tube. The specimens were packed in ice and taken to the Area Cytogenetic Unit at St. Ebba's Hospital, Epsom, where they were cultured within two hours of being drawn. Those examining the specimens had no knowledge of their origin. Furthermore, blood was drawn from patients and controls on a random basis unknown to any of the authors.

The cells were cultured by the method of Moorhead *et al.* (1960) and were processed in batches which were kept as large as practicable to ensure as much uniformity as possible but varied according to the availability of subjects. The cultures were harvested after 48 hours of incubation to ensure that as far as possible cells were in their first division (Buckton and Pike, 1964). The slides were all air-dried and were stained with lactoacetic orcein.

One hundred cells were analysed for each subject, and chromosomes were grouped according to the Denver System (1966). Each aneuploid cell was scored, and the chromosome group to which the extra or missing chromosome belonged was recorded. The number of chromatid and isochromatid gaps and rings was recorded for each cell; a gap being a complete discontinuity of a portion of the chromatid. The chromosome group to which the damaged member belonged was also recorded. Care was taken to avoid scoring secondary constrictions. Unstable chromosome rearrangements, dicentrics and fragments were also noted.

Only when all specimens had been analysed was the code broken and patients and controls divided for comparison.

Care was taken to exclude from this project all persons who had recently suffered from a virus infection or any other condition known to be a possible cause of chromosome damage.

## RESULTS

The characteristics of the subjects are given in Table I. It was found that prevalence of all the chromosome abnormalities examined decreased as the chromosome analysis proceeded (Table II). The cause of this change is not known, but there is no evidence to suggest that it is associated with the LSD therapy.

As the early groups contained more patients than controls, this change would bias comparisons made between them. Straightforward analysis of variance techniques were not applicable, as the various effects were not balanced.

Instead, the prevalence of each abnormality was fitted to a polynomial where the predictor variable was the subject's serial number, which gives an estimate of when the chromosome analysis was done. Separate polynomials were fitted for subjects and controls (Armitage, P., 1971).

It was found that a quadratic function fitted all the data adequately, and that, except for the intercept, the coefficients for the patients and controls were not statistically significantly different. So quadratics were fitted to the prevalence of each abnormality, with the same coefficients for patients and controls but different coefficients for the intercepts.

The difference between the intercepts is a measure of the difference in response between the patients and controls which is independent of the change associated with the subject's serial number. It is demonstrated that there is no statistically significant difference between the LSD treated group and the control group in any of the four chromosome abnormalities studied (Table III).

No association was found between the number of chromatid gaps and the following: total dose of LSD, the length of treatment, patient's sex, marital state or age, or the time between the end of the LSD therapy and the time the blood samples were taken.

## DISCUSSION

The literature on the damage to human chromosomes by LSD when given therapeutically, taken voluntarily for research purposes, or self-administered by abusers, is extensive and controversial. Earlier reports almost uniformly recorded LSD-induced chromosomal abnormalities (Cohen *et al.* 1967a; Cohen *et al.*, 1967b; Egozcue *et al.*, 1968; Irwin and Egozcue, 1967; Nielsen *et al.*, 1968), while later articles questioned whether LSD was capable of producing such abnormalities *in vivo* (Long, 1972; Lucas and Wolfgang, 1970; Rumke, 1964; Stenchever and Jarvis, 1970). A leading article in the *British Medical Journal*, 27 June 1968, gave an objective assessment of previous investigations and emphasized that the amount of LSD taken was sometimes in doubt and derived from users' statements.

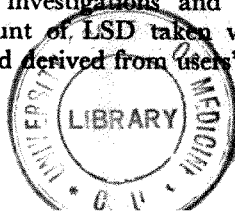




TABLE I

| Serial No. | Patient (P)<br>control (C) | Age | Marital status | Sex | Diagnosis             | Total LSD in mcgms. | Length of treatment in weeks | Chromatid gaps | Isochromatid gaps | Chromosomes lost/gained | Fragments, Di tri centrics rings |
|------------|----------------------------|-----|----------------|-----|-----------------------|---------------------|------------------------------|----------------|-------------------|-------------------------|----------------------------------|
| 1          | P                          | 38  | M              | M   | Anxiety state         | 3,000               | 156                          | 3              | 3                 | 0                       | 0                                |
| 2          | P                          | 38  | M              | M   | Anxiety state         | 3,825               | 156                          | 11             | 1                 | 0                       | 0                                |
| 3          | P                          | 25  | S              | F   | Personality disorder  | 9,025               | 260                          | 14             | 0                 | 0                       | 0                                |
| 4          | C                          | 28  | M              | M   | —                     | —                   | —                            | 6              | 2                 | 0                       | 0                                |
| 5          | C                          | 32  | M              | M   | —                     | —                   | —                            | 5              | 3                 | 0                       | 3                                |
| 6          | P                          | 29  | S              | F   | Personality disorder  | 1,000               | 39                           | 9              | 2                 | 1                       | 2                                |
| 7          | P                          | 31  | S              | F   | Personality disorder  | 300                 | 4                            | 16             | 4                 | 0                       | 0                                |
| 8          | C                          | 26  | S              | M   | —                     | —                   | —                            | 3              | 1                 | 0                       | 0                                |
| 9          | C                          | 23  | S              | M   | —                     | —                   | —                            | 11             | 3                 | 0                       | 1                                |
| 10         | C                          | 27  | M              | M   | —                     | —                   | —                            | 11             | 1                 | 0                       | 1                                |
| 11         | P                          | 39  | M              | M   | Obsess/Neurosis       | 1,000               | 12                           | 8              | 0                 | 8                       | 0                                |
| 12         | P                          | 30  | M              | M   | Personality disorder  | 11,050              | 208                          | 11             | 3                 | 0                       | 1                                |
| 13         | P                          | 40  | M              | F   | Personality disorder  | 975                 | 7                            | 2              | 0                 | 4                       | 4                                |
| 14         | P                          | 24  | S              | M   | Sexual aberration     | 1,500               | 104                          | 15             | 5                 | 0                       | 0                                |
| 15         | C                          | 48  | M              | M   | —                     | —                   | —                            | 14             | 4                 | 4                       | 1                                |
| 16         | P                          | 24  | S              | F   | Personality disorder  | 500                 | 5                            | 7              | 0                 | 0                       | 0                                |
| 17         | P                          | 47  | M              | M   | Alcoholic             | 1,250               | 8                            | 10             | 0                 | 0                       | 0                                |
| 18         | P                          | 34  | S              | F   | Personality disorder  | 750                 | 6                            | 12             | 0                 | 0                       | 0                                |
| 19         | C                          | 40  | S              | F   | —                     | —                   | —                            | 9              | 1                 | 0                       | 0                                |
| 21         | C                          | 26  | M              | M   | —                     | —                   | —                            | 2              | 1                 | 0                       | 1                                |
| 22         | P                          | 38  | S              | M   | Personality disorder  | 1,300               | 12                           | 2              | 1                 | 0                       | 0                                |
| 24         | P                          | 32  | S              | M   | Personality disorder  | 4,400               | 156                          | 4              | 0                 | 0                       | 0                                |
| 25         | C                          | 38  | M              | F   | —                     | —                   | —                            | 1              | 0                 | 0                       | 0                                |
| 26         | C                          | 43  | M              | F   | —                     | —                   | —                            | 5              | 0                 | 0                       | 0                                |
| 27         | P                          | 26  | S              | F   | Personality disorder  | 1,300               | 12                           | 9              | 0                 | 0                       | 0                                |
| 28         | P                          | 33  | M              | M   | Anxiety state         | 825                 | 6                            | 5              | 0                 | 0                       | 0                                |
| 29         | P                          | 51  | M              | M   | Psoriasis             | 900                 | 8                            | 5              | 0                 | 0                       | 0                                |
| 30         | P                          | 35  | M              | M   | Affective disorder    | 400                 | 6                            | 5              | 0                 | 0                       | 0                                |
| 31         | C                          | 46  | M              | M   | —                     | —                   | —                            | 5              | 1                 | 0                       | 0                                |
| 32         | C                          | 23  | S              | F   | —                     | —                   | —                            | 3              | 0                 | 0                       | 0                                |
| 33         | C                          | 50  | M              | M   | —                     | —                   | —                            | 6              | 2                 | 1                       | 2                                |
| 34         | P                          | 38  | M              | M   | Anxiety state         | 3,000               | 156                          | 4              | 0                 | 0                       | 0                                |
| 35         | P                          | 20  | S              | M   | Sexual aberration     | 1,000               | 12                           | 2              | 1                 | 0                       | 0                                |
| 36         | C                          | 35  | M              | F   | —                     | —                   | —                            | 3              | 0                 | 0                       | 0                                |
| 37         | C                          | 31  | M              | F   | —                     | —                   | —                            | 9              | 1                 | 3                       | 4                                |
| 38         | C                          | 35  | M              | F   | —                     | —                   | —                            | 4              | 0                 | 2                       | 0                                |
| 39         | P                          | 29  | M              | F   | Obsess/Neurosis       | 7,475               | 195                          | 2              | 1                 | 0                       | 0                                |
| 40         | P                          | 32  | S              | M   | Personality disorder  | 2,000               | 26                           | 13             | 1                 | 1                       | 3                                |
| 41         | P                          | 29  | M              | F   | Sex difficulties      | 1,900               | 39                           | 3              | 0                 | 0                       | 0                                |
| 42         | C                          | 31  | M              | F   | —                     | —                   | —                            | 3              | 1                 | 0                       | 0                                |
| 43         | C                          | 47  | M              | F   | —                     | —                   | —                            | 3              | 0                 | 0                       | 0                                |
| 44         | P                          | 42  | S              | M   | Personality disorder  | 700                 | 6                            | 5              | 0                 | 0                       | 0                                |
| 45         | C                          | 25  | S              | M   | —                     | —                   | —                            | 3              | 0                 | 0                       | 0                                |
| 46         | P                          | 38  | M              | M   | Psoriasis             | 1,250               | 10                           | 7              | 0                 | 0                       | 0                                |
| 47         | C                          | 38  | M              | M   | —                     | —                   | —                            | 3              | 1                 | 4                       | 0                                |
| 48         | C                          | 27  | S              | F   | —                     | —                   | —                            | 2              | 4                 | 0                       | 0                                |
| 49         | P                          | 22  | M              | M   | Aggressive psychopath | 250                 | 3                            | 4              | 0                 | 0                       | 0                                |
| 51         | P                          | 38  | M              | M   | Personality disorder  | 1,150               | 10                           | 6              | 0                 | 0                       | 0                                |
| 52         | P                          | 57  | M              | M   | Personality disorder  | 475                 | 5                            | 4              | 1                 | 0                       | 0                                |

TABLE I—continued

| Serial No. | Patient (P)<br>control (C) | Age | Marital status | Sex | Diagnosis            | Total LSD in mcgms. | Length of treatment in weeks | Chromatid gaps | Isochromatid gaps | Chromosomes lost/gained | Fragments, Di tri centrics rings |
|------------|----------------------------|-----|----------------|-----|----------------------|---------------------|------------------------------|----------------|-------------------|-------------------------|----------------------------------|
| 53         | P                          | 53  | M              | M   | Alcoholism           | 14,169              | 312                          | 2              | 0                 | 1                       | 3                                |
| 54         | P                          | 38  | M              | M   | Sexual aberrations   | 17,000              | 338                          | 4              | 0                 | 0                       | 0                                |
| 55         | P                          | 48  | M              | M   | Sexual aberrations   | 250                 | 4                            | 2              | 0                 | 0                       | 0                                |
| 56         | C                          | 30  | M              | F   | —                    | —                   | —                            | 1              | 1                 | 0                       | 0                                |
| 57         | C                          | 26  | M              | F   | —                    | —                   | —                            | 3              | 0                 | 0                       | 0                                |
| 58         | C                          | 30  | S              | M   | —                    | —                   | —                            | 3              | 0                 | 0                       | 0                                |
| 59         | P                          | 44  | M              | F   | Phobic anxiety       | 425                 | 4                            | 2              | 1                 | 0                       | 0                                |
| 60         | P                          | 32  | M              | F   | Phobic anxiety       | 1,225               | 14                           | 2              | 0                 | 0                       | 0                                |
| 61         | P                          | 46  | M              | F   | Obsess/Neurosis      | 175                 | 4                            | 4              | 1                 | 0                       | 0                                |
| 62         | C                          | 26  | S              | F   | —                    | —                   | —                            | 8              | 1                 | 0                       | 0                                |
| 63         | C                          | 19  | S              | F   | —                    | —                   | —                            | 0              | 0                 | 0                       | 0                                |
| 64         | C                          | 49  | M              | F   | —                    | —                   | —                            | 1              | 0                 | 0                       | 0                                |
| 65         | P                          | 23  | S              | M   | Anxiety state        | 300                 | 4                            | 1              | 0                 | 0                       | 0                                |
| 66         | C                          | 28  | S              | F   | —                    | —                   | —                            | 1              | 1                 | 0                       | 0                                |
| 67         | P                          | 24  | S              | M   | Psoriasis            | 750                 | 6                            | 0              | 0                 | 0                       | 0                                |
| 68         | C                          | 30  | M              | F   | —                    | —                   | —                            | 0              | 2                 | 0                       | 0                                |
| 69         | P                          | 47  | S              | M   | Sexual aberrations   | 1,125               | 9                            | 2              | 0                 | 0                       | 2                                |
| 70         | P                          | 40  | S              | F   | Personality disorder | 800                 | 6                            | 2              | 3                 | 0                       | 0                                |
| 71         | P                          | 25  | S              | F   | Personality disorder | 300                 | 5                            | 3              | 1                 | 0                       | 0                                |
| 72         | C                          | 56  | M              | F   | —                    | —                   | —                            | 2              | 0                 | 0                       | 0                                |
| 73         | C                          | 32  | S              | F   | —                    | —                   | —                            | 4              | 3                 | 0                       | 0                                |
| 74         | C                          | 45  | S              | F   | —                    | —                   | —                            | 4              | 1                 | 3                       | 4                                |
| 75         | P                          | 37  | M              | M   | Personality disorder | 1,300               | 8                            | 4              | 0                 | 0                       | 0                                |
| 76         | P                          | 23  | S              | F   | Obsess/Neurosis      | 650                 | 6                            | 0              | 0                 | 2                       | 0                                |
| 77         | P                          | 44  | M              | M   | Sexual aberrations   | 350                 | 3                            | 2              | 0                 | 0                       | 0                                |
| 78         | P                          | 23  | S              | M   | Obsess/Neurosis      | 500                 | 6                            | 5              | 0                 | 0                       | 0                                |
| 79         | P                          | 29  | M              | F   | Obsess/Neurosis      | 1,755               | 78                           | 1              | 0                 | 0                       | 0                                |
| 80         | P                          | 24  | M              | F   | Sexual aberrations   | 1,125               | 13                           | 4              | 0                 | 0                       | 0                                |
| 81         | P                          | 55  | M              | M   | Sexual aberrations   | 300                 | 4                            | 4              | 1                 | 0                       | 0                                |
| 82         | P                          | 22  | M              | F   | Personality disorder | 395                 | 5                            | 4              | 0                 | 0                       | 0                                |
| 83         | C                          | 18  | S              | M   | —                    | —                   | —                            | 3              | 1                 | 0                       | 0                                |
| 84         | C                          | 37  | M              | F   | —                    | —                   | —                            | 5              | 1                 | 0                       | 0                                |
| 85         | C                          | 18  | S              | M   | —                    | —                   | —                            | 4              | 0                 | 0                       | 0                                |
| 86         | C                          | 26  | M              | F   | —                    | —                   | —                            | 5              | 0                 | 0                       | 0                                |
| 87         | C                          | 27  | M              | F   | —                    | —                   | —                            | 1              | 0                 | 0                       | 0                                |
| 88         | C                          | 40  | M              | M   | —                    | —                   | —                            | 1              | 1                 | 0                       | 0                                |
| 89         | C                          | 25  | S              | M   | —                    | —                   | —                            | 2              | 0                 | 0                       | 0                                |
| 90         | C                          | 25  | S              | F   | —                    | —                   | —                            | 1              | 0                 | 0                       | 0                                |
| 91         | C                          | 29  | M              | M   | —                    | —                   | —                            | 1              | 0                 | 0                       | 0                                |
| 92         | C                          | 26  | M              | M   | —                    | —                   | —                            | 2              | 1                 | 0                       | 0                                |
| 93         | C                          | 25  | M              | M   | —                    | —                   | —                            | 3              | 0                 | 0                       | 0                                |
| 94         | P                          | 38  | S              | M   | Obsess/Neurosis      | 125                 | 2                            | 3              | 2                 | 0                       | 0                                |
| 95         | C                          | 42  | M              | F   | —                    | —                   | —                            | 1              | 1                 | 0                       | 0                                |
| 96         | C                          | 57  | M              | F   | —                    | —                   | —                            | 2              | 1                 | 0                       | 0                                |
| 97         | C                          | 60  | M              | F   | —                    | —                   | —                            | 6              | 3                 | 1                       | 0                                |
| 98         | C                          | 61  | M              | F   | —                    | —                   | —                            | 5              | 1                 | 0                       | 0                                |
| 99         | C                          | 62  | M              | F   | —                    | —                   | —                            | 7              | 0                 | 0                       | 0                                |
| 100        | C                          | 58  | M              | M   | —                    | —                   | —                            | 0              | 3                 | 0                       | 0                                |
| 101        | C                          | 56  | S              | F   | —                    | —                   | —                            | 1              | 0                 | 0                       | 0                                |
| 102        | P                          | 44  | M              | M   | Personality disorder | 4,400               | 156                          | 4              | 1                 | 0                       | 0                                |
| 103        | P                          | 38  | M              | M   | Anxiety state        | 3,000               | 156                          | 4              | 0                 | 0                       | 0                                |

TABLE II

Mean number of chromosome abnormalities per subject (100 cells) in patients treated with LSD and controls according to batch

| Serial number group            | ..      | .. | 1       | 2        | 3        | 4        | 5         | Totals |
|--------------------------------|---------|----|---------|----------|----------|----------|-----------|--------|
| Patient serial number          | ..      | .. | 1 to 19 | 21 to 40 | 41 to 60 | 61 to 80 | 81 to 104 |        |
| Chromatid gaps                 | Total*  | .. | 9.3     | 4.7      | 3.3      | 2.4      | 3.0       | 4.45   |
|                                | Patient | .. | 9.8     | 5.1      | 3.7      | 2.3      | 3.8       |        |
|                                | Control | .. | 8.4     | 4.2      | 2.63     | 2.5      | 2.8       |        |
| Isochromatid gaps              | Total*  | .. | 1.7     | 0.47     | 0.47     | 0.65     | 0.74      | 0.81   |
|                                | Patient | .. | 1.5     | 0.4      | 0.18     | 0.42     | 0.8       |        |
|                                | Control | .. | 2.1     | 0.56     | 0.88     | 1        | 0.72      |        |
| Chromosomes lost/gained        | Total*  | .. | 0.9     | 0.37     | 0.26     | 0.25     | 0.043     | 0.35   |
|                                | Patient | .. | 1.1     | 0.1      | 0.091    | 0.17     | 0         |        |
|                                | Control | .. | 0.57    | 0.67     | 0.5      | 0.38     | 0.056     |        |
| Fragments rings bi/tricentrics | Total*  | .. | 0.68    | 0.53     | 0.16     | 0.3      | 0         | 0.32   |
|                                | Patient | .. | 0.58    | 0.3      | 0.27     | 0.17     | 0         |        |
|                                | Control | .. | 0.86    | 0.78     | 0        | 0.5      | 0         |        |
| Subjects                       | Total   | .. | 19      | 19       | 19       | 20       | 23        | 100    |
|                                | Patient | .. | 12      | 10       | 11       | 12       | 5         | 50     |
|                                | Control | .. | 7       | 9        | 8        | 8        | 18        | 50     |

\* The differences between the serial number groups are statistically significant at the 0.001 level.

TABLE III

| Type of abnormality            | Mean number per subject | Difference between patient and control groups | 95% confidence limits | Probability   |
|--------------------------------|-------------------------|-----------------------------------------------|-----------------------|---------------|
| Chromatid gaps* .. ..          | 0.53*                   | 0.09*                                         | +0.2*                 | 0.2 > p > 0.1 |
|                                |                         |                                               | -0.02                 |               |
| Isochromatid gaps .. ..        | 0.81                    | -0.35                                         | +0.08                 | 0.2 > p > 0.1 |
|                                |                         |                                               | -0.78                 |               |
| Chromosomes lost/gained ..     | 0.35                    | -0.11                                         | +0.35                 | 0.7 > p > 0.6 |
|                                |                         |                                               | -0.58                 |               |
| Fragments Di/tricentrics rings | 0.32                    | -0.13                                         | +0.23                 | 0.5 > p > 0.4 |
|                                |                         |                                               | -0.5                  |               |

\* Calculations on chromatid gaps were done on a log<sub>10</sub> transformation of the original data. The transformed results are shown in this Table.

Nielsen *et al.* (1968) reported an increased frequency of gaps and breaks in the chromosomes of 17 psychiatric patients treated with different psychotropic drugs compared with those of 13 not so treated. Nielsen *et al.* (1969), reported a further study of cultures from 13 patients treated with chlorpromazine, 15 treated with perphenazine, and 9 treated with LSD. They concluded that chlorpromazine had some

effects on chromosomes, but not to the extent found with perphenazine and LSD. Perphenazine had effects on chromosomes similar to those of LSD. They furthermore noted a significantly higher frequency of breaks, gaps and hypodiploid cells in patients treated with perphenazine and LSD compared with 41 controls. Their results indicate that the higher the dosage and the longer the treatment the more frequently

are abnormalities to be found in the chromosomes of patients treated with perphenazine. The accumulated daily dosage over a period of 5-12 months amounted to a total of 6-15 g.

Our controlled study of the largest number of patients yet reported concludes that there is no evidence that LSD in the doses used caused any change in the number of chromosome abnormalities. It further supports the conclusions of a recent review (Long, 1972) that LSD does not cause chromosome damage, quoting the report by Tjio *et al.* (1969) after our study began. These workers studied the chromosomes of 32 patients before and after they took LSD as part of a double-blind controlled research. Statistical analysis revealed no significant difference between the 'before' and 'after' LSD chromosomal aberration rates. In addition post-LSD studies of 8 normal subjects who had received LSD in previous experiments, using the same methods, showed no chromosome aberrations.

Our project has involved analysing 10,000 cells. Chromosome damage falls into two categories: (a) minor damage, such as chromatid gaps and isochromatid gaps which are stable and some of which are repairable; (b) major damage which results in unstable chromosomes such as rings and dicentrics, related to irradiation dosage (Lloyd, D. C. *et al.*, 1973).

In our investigation there is no significant difference in either major or minor damage between patients and controls. Overall there was slightly (but not significantly) more damage in the controls.

### Pregnancy

Research into the teratogenic effects of LSD in animals has shown conflicting results (Alexander *et al.*, 1967; Auerbach and Rugowski, 1967; Geber, 1967; Zellweger *et al.*, 1967), and created concern lest LSD might have teratogenic effects on the human foetus. Evidence shows that the action of a drug in a given strain of species cannot be reliably inferred from another of the same species, and findings from animal experiments cannot be used for a reliable prediction of the effects of such a drug in humans (Rumke, 1964).

There are a number of reports, based on

single cases, of mothers who had taken LSD during pregnancy and gave birth to an abnormal foetus (*Birth Defects*, 1966; Irwin and Egozcue, 1967; Sturelid and Kihlman, 1969; Zellweger *et al.*, 1967). However, since these mothers were also taking other drugs no specific causal relationship can be proved against LSD. The literature does not indicate the number of mothers taking LSD who gave birth to normal infants.

In our study 5 patients gave birth to a total of 7 healthy infants (4 boys and 3 girls) and there were no abnormal births.

### Further studies

Large-scale scanning programmes using all the criteria we have adopted would be extremely time-consuming and involve a large number of highly-trained staff. It is probable that such programmes will not be practicable until the advent of computer analysis of cells.

### SUMMARY

This controlled study of chromosome aberrations of 100 lymphoid cells in each of 50 patients and 50 controls shows no significant difference between the control and patient groups, and supports the latest review of the literature that LSD does not cause chromosome breakage.

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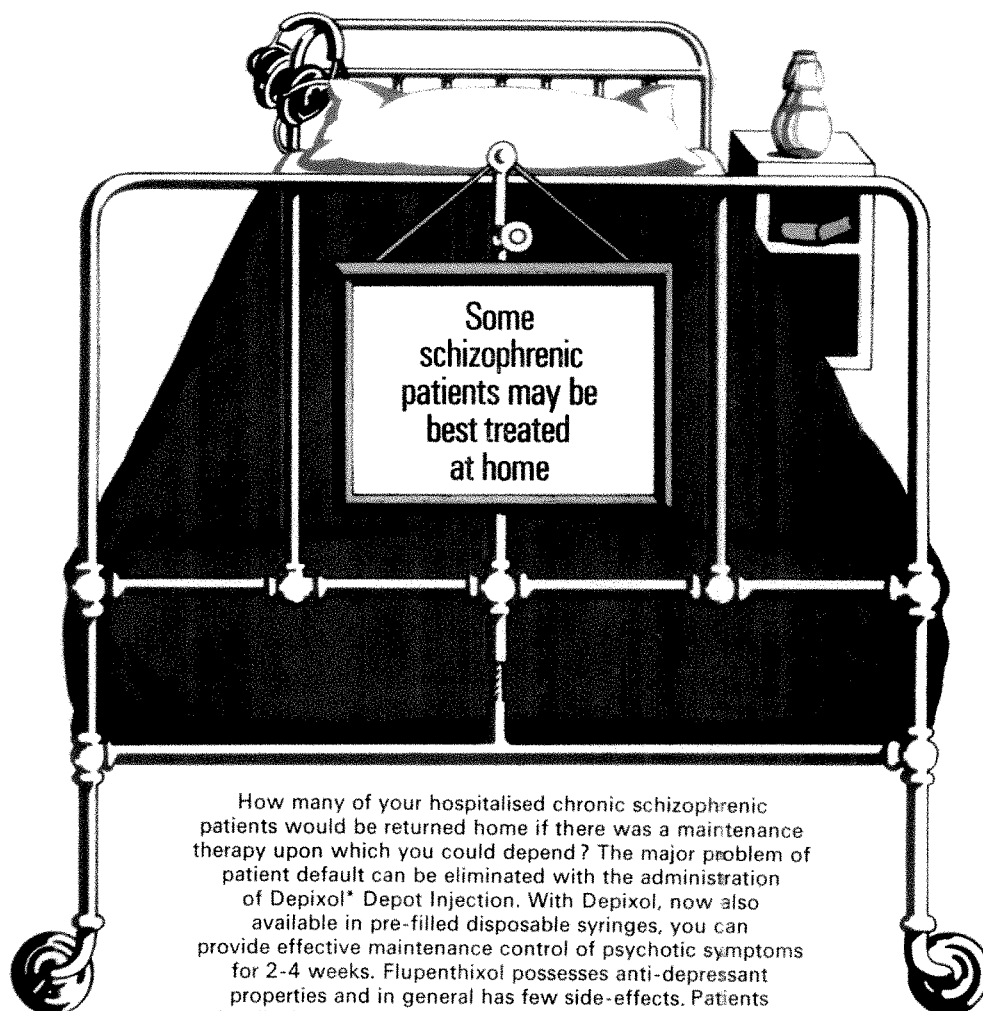
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6. *Curr. Med. Res. and Opin.* (1974), 2, 78-80. Each Fluanxol tablet contains 0.5 mg. Flupenthixol as the dihydrochloride. Full information is available on request.

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## Surreptitious Ingestion of Warfarin

By C. D. FORBES, C. R. M. PRENTICE and A. B. SCLARE

Surreptitious ingestion of anticoagulant drugs is a rare condition which presents as an obscure bleeding tendency associated with gross depletion of the vitamin K dependent factors (factors II, VII, IX and X). In all previously reported cases the patients have denied taking drugs but chemical analysis of the plasma has shown the presence of members of the coumarin or indanedione groups.

We wish to report the case of a young male laboratory technician who presented with a severe haemorrhagic state resulting from surreptitious ingestion of warfarin.

### CASE REPORT

This male patient, age 27 years, had worked as a technician in a renal dialysis unit during the preceding three years. In May 1970 he was admitted as an emergency following three days of continuous bleeding from a small abrasion on the right leg. For five days prior to this he had noted multiple bruising on his arms and legs and oozing of blood from his gums. Examination showed purpuric spots on both legs, bleeding from the gums and continued oozing from the abrasion on the leg.

He had a ten-year history of dyspepsia, and in March 1969 he had a severe haematemesis which required eight pints of blood, and necessitated vagotomy and pyloroplasty. At operation a bleeding duodenal ulcer was found. He remained in good health until September 1969, when a further haematemesis caused him to be readmitted to hospital. At that time a barium meal showed no evidence of peptic ulcer. A series of further haematemeses occurred over the next two months, and in December 1969 a partial gastrectomy was carried out. At operation, excessive bleeding from all cut surfaces was noted and the gastric mucosa was haemorrhagic, but no ulcer was found. On questioning he stated that he had always bruised easily and bled excessively from cuts, although an appendicectomy in 1958 had been uneventful.

Investigations showed that the bleeding time was 8 minutes, but Hess's test was negative. The haemoglobin was 12.6 G per 100 ml. with a normal blood

TABLE

|                                             | 25.5.70 | Post vit. K <sub>1</sub><br>6.6.70 |
|---------------------------------------------|---------|------------------------------------|
| One-stage prothrombin time (secs.)          | 305     | 15 (normal)                        |
| Kaolin partial thromboplastin time (secs.)  | 115     | 43 (normal)                        |
| Thrombin clotting time (secs.)              | 12      |                                    |
| Factor II (per cent)                        | 10      |                                    |
| Factor IX                                   | 1       |                                    |
| Factor X                                    | 4       |                                    |
| Factor V                                    | 97      |                                    |
| Factor VIII                                 | 175     |                                    |
| Platelet count ( $\times 10^3$ per cu. cm.) | 231     |                                    |
| Fibrinogen mg./100 ml.                      | 305     |                                    |
| Plasma warfarin ( $\mu$ g./ml.)             | 7       |                                    |

Coagulation results before and after vitamin K<sub>1</sub> therapy in a patient surreptitiously ingesting warfarin.

film and platelet count. Electrolyte values, blood urea and liver function tests were normal apart from slight elevation of the alkaline phosphatase at 19 King Armstrong units. The possibility of a malabsorption syndrome was excluded by the finding of normal faecal fat excretion and xylose absorption; a jejunal biopsy, carried out after correction of the haemorrhagic defect, was also normal. The results of blood coagulation studies before and after administration of Vitamin K<sub>1</sub> are shown in the Table.

The patient was questioned as to the possibility of surreptitious ingestion of anticoagulant drugs but denied this and took his own discharge from hospital.

Two months later, in July 1970, he was readmitted with prolonged haemorrhage from a small cut on the right hand. On this occasion the one-stage prothrombin time was 250 seconds, corrected by administration of vitamin K<sub>1</sub>. The plasma warfarin concentration was 6  $\mu$ g./ml. On questioning he then admitted that 'by accident' he had taken some 3-6 pink tablets daily at intervals over the past year. The tablets were identified as warfarin of 5 mg. strength.

Psychiatric assessment indicated that he had a tense, anxious personality with a complicated and



unhappy family history. His father, a seaman, had apparently died soon after his birth, and at the age of seven years he was sent to live with his 'aunt' who turned out to be a friend rather than a true relative. The aunt died when he was seventeen, and he was then looked after by her sister with whom he had an unsatisfactory relationship. Recently this guardian had broken up a friendship between him and a girl. Since starting psychotherapy he has made good progress and become more self-confident and less passive in his behaviour.

#### DISCUSSION

The effects of excessive dosage with anticoagulant drugs are well recognized and have been extensively reviewed (Douglas, 1962). Overdosage may be accidental (Breckenridge and Kellermeyer, 1964), may be given to accomplish murder (Ikkala, Nevanlinna, Pelkoneu and Pyorala, 1964), may be taken in a suicide attempt (Holmes and Love, 1952) or may be taken to produce factitious disease (Stafne and Moe, 1951; Cosgriff, 1953).

Surreptitious ingestion of anticoagulants was first recognized in 1951 by Stafne and Moe, and since then at least 37 cases have been recorded. The majority of case reports have come from America, and to our knowledge no case has previously been described in the United Kingdom. The diagnosis was suspected in this patient when he was found to have a profound haemorrhagic state with depression of the vitamin K dependent factors but no evidence of intestinal malabsorption or liver dysfunction. The diagnosis was confirmed by finding high levels of warfarin in the plasma.

The majority of patients described have been female, and almost all have worked in hospitals in medical or paramedical capacities or had previously received therapeutic anticoagulant dosage for thrombo-embolism. The patient here reported was a man with chronic neurotic personality, his early background having been one of considerable emotional deprivation coupled with ill-treatment. The haemorrhagic episodes induced by warfarin ingestion appeared to represent a form of self-punishment and a means of seeking admission to hospital as an alternative to an unpalatable home situation. These features conform closely with the psychodynamics described by Agle, Ratnoff and

Spring (1970) and resemble the psychiatric symptoms reported in the case reports of Bowie, Todd, Thomson, Owen and Wright (1965), Cosgriff (1953), O'Reilly and Aggeler (1966).

Surreptitious ingestion of anticoagulant drugs represents a form of deliberate disability (Hawkins, Jones, Sim and Tibbetts, 1956) in which the patient consciously deals with an emotionally stressful set of circumstances by inducing a simulated illness. In this regard it is akin to the Munchausen syndrome (Asher, 1951), dermatitis artefacta (Lyell, 1972) and autoerythrocyte sensitization (Gardner and Diamond, 1955). Treatment of all such syndromes can be arduous, and must avoid from the outset a triumphant exposure on the doctor's part of the patient's deceptions.

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## Inter-rater Reliability of Ward Rating Scales

By JOHN N. HALL

Psychiatrists, psychologists, and nursing staff are increasingly making direct observations and ratings of ward behaviour. Characteristically, a nurse may be asked to complete a multi-item rating scale on a group of patients during the course of a drug trial. Several factors are involved in the choice of an appropriate scale for a particular purpose. Among these factors are the number of points per item, which defines the sensitivity to change of the item, and the total number of items in the scale, which affects the time taken to complete the scale and hence the frequency of rating that can be permitted in an assessment schedule.

As with any measurement device, the usefulness of rating scales depends on their validity and reliability. Most of these scales possess high face validity, and any other validating criteria would be using essentially the same information as that used to carry out the rating. Reliability, on the other hand, is a much greater problem, and one frequently ignored in practice. The need for greater attention to be paid to reliability, particularly between pairs of raters, is illustrated by examining all those papers that have appeared in Volumes 120 and 121 (1972) of the *British Journal of Psychiatry*. Twenty-five papers used a rating scale of some form, apart from ratings whose sole purpose was to establish a diagnosis or to determine the presence or absence of individual symptoms or responses. Ten papers used some standardized rating instrument, either alone or in conjunction with other assessment procedures; the remaining 15 papers used a variety of ratings of clinical or motor behaviour.

Only 7 out of the 25 papers formally assessed inter-rater reliability, 4 by use of a correlation method, and 3 by use of an agreement method. One paper described the use of two raters, and another of preliminary training procedures in reliability. The remaining 16 papers made no mention of procedures to assess reliability of the ratings. It is dangerous to assume that even

standardized scales with quoted reliabilities will give equally satisfactory results when used on a different population with raters who are probably less well trained. Additionally, Reid (1970) has reported that the reliability of observers dropped when they were told that reliability would not be assessed.

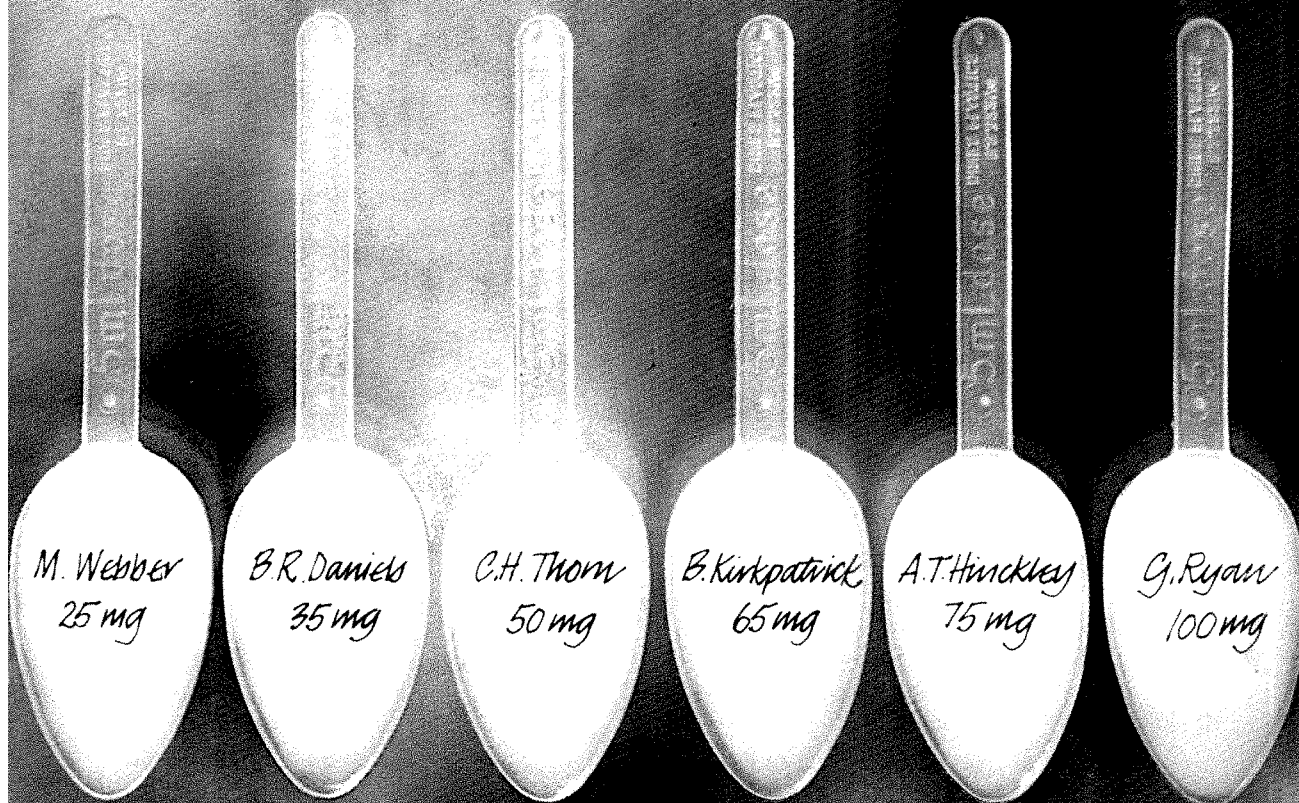
The several and many factors leading to disagreement between raters have been well-established for many years, as shown by Guilford's (1954) extensive list. Such factors as the halo effect and the central tendency have there and elsewhere been fully described. These factors were originally derived from the use of rating scales in interview procedures, where there is often a considerable degree of at least implied control of the subject's behaviour, and where the rater is frequently highly skilled, with no other responsibilities during the observation period.

By contrast, in the ward situation the patient is free to move without restraint and is free to communicate with other patients and staff. The observer rating the patient is frequently a participant observer, and is therefore not free to relinquish all therapeutic activities for the sake of accurate observation. Table I reveals the

TABLE I  
*Differences between the interview and ward situation*

| Feature                                                                    | Interview situation | Ward situation |
|----------------------------------------------------------------------------|---------------------|----------------|
| Control of subject behaviour                                               | Good                | Poor           |
| Sophistication of rater                                                    | Good                | Poor           |
| Degree of continuous observation possible                                  | Good                | Poor           |
| Ability to clarify uncertain responses                                     | Good                | Poor           |
| Necessity for rater to retain information for period of time before rating | Little              | Frequent       |
| Physical proximity of rater to subject                                     | Constant and close  | Variable       |

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extent of the differences between the basic features of the interview situation and of the ward situation. It can be seen that several features of the ward situation actively contribute to the likelihood of poor inter-rater reliability.

There are many standardized ward rating scales now available, such as those of Wing (1961), and Honigfeld and Klett (1965). Although these scales vary in their purpose, length, and other characteristics, inter-rater reliability in each case is assessed by obtaining two or more sets of scores from different raters and examining the association between the sets of obtained scores. Among the methods frequently used to calculate reliability are: (1) correlation between total scores of subjects; (2) percentage agreement between raters, either exact, or plus-or-minus-one agreement; (3) Chi-squared test. A number of assumptions may be made when selecting one of these methods, and these assumptions deserve close examination.

*Assumption 1: Scores are distributed normally*

With many conventional psychometric instruments and questionnaires the distribution of item scores can be related to the normal, or Gaussian, distribution. However, rating scales such as the Wing ward scale are clearly not intended to produce statistically normal distributions, as one end point of each item includes both the average and the 'above average' sections of the general population. The distribution of scores finally obtained will therefore depend on the degree of handicap in the rated sample, which will often contain many grossly abnormal individuals. Statistical methods assuming normality of distribution may not be justified in such circumstances.

*Assumption 2: 'Agreement' is meaningful*

With rating scales having more than two points per item, there is the possibility that agreement between two raters on an item may be complete, may be partial, or may be non-existent. For example, the pairs of scores obtained on five separate five-point (0 to 4) items could be 0-0, 1-2, 3-1, 0-3, 0-4. 'Agreement' then becomes a continuous dimension. Percentage exact agreement fails to give credit for partial agreement, and the alternative

percentage agreement plus-or-minus-one fails to take account of the total score pattern. For agreement to be a useful measure it should take account of both partial agreement and the total score distribution.

*Assumption 3: Chance agreement is negligible*

There is a certain level of agreement between two raters on an item that could be attained by chance alone. For example, for a five-point item there is a 1 in 5, or 20 per cent, probability that the two raters will agree on a point by chance. If one point or category of an item is consistently rated more frequently than others then the overall probability of agreement by chance will be higher. If the probability of one point being rated by each rater is, say, 0.7, the chance probability of agreement for that point will be  $0.7 \times 0.7 = 0.49$ . It can be shown that for a three-point item, if any one point is selected two-thirds of the time by both raters overall agreement by chance for the whole item will range between 48 per cent and 54 per cent. For higher rates of agreement on single points it can be seen that very high apparent reliabilities can be obtained by chance alone. Thus, some items in Honigfeld and Klett's scale, such as 'needs help in dressing' (item 22), tend to generate highly stable rating responses when used with institutionalized patients, with correspondingly high levels of apparent reliability.

*Assumption 4: Total scores are meaningful*

Score reliabilities are often calculated using total scores. While total scores are normally more 'reliable' or stable than item scores, they may lead to false results in calculating inter-rater reliability. Since nurses frequently know their patients extremely well, nursing staff often come to have heavily generalized and stereotyped expectancies of their patients, and under such conditions 'halo' effects are maximized. Total score reliabilities may therefore give spurious values, so that the reliability of the individual item scores making up the total score should be examined.

*Assumption 5: Mean scores of both raters are similar*

Correlation methods fail to take account of differences between the means, so that apparently good reliabilities can be obtained with



significant differences between sets of scores. The addition of a constant in order to correct one set of means will not correct the skewed form of score distribution that may be associated with such differences.

These five assumptions may well not be valid when using ward, or indeed other, rating scales. There is therefore a need for a method of calculating reliability that: (1) makes no assumptions about the shape of the score distribution; (2) does not rely on 'agreement'; (3) takes account of chance agreement; (4) makes use of item scores; (5) corrects for differences in means.

#### Weighted Kappa ( $\kappa_w$ )

Cohen (1960) proposed a coefficient of agreement, the kappa coefficient, which took account of chance levels of agreement. A modification of kappa called weighted kappa has also been developed (Cohen, 1968), which takes account of the relative level of disagreements between two observers. The statistic weighted kappa has been used in assessing the reliability of psychiatric diagnosis (Fleiss *et al.*, 1972). Costello (1973) has illustrated the value of the coefficient in calculating the reliability of direct observations of discrete events in a time sampling procedure.

The equation for weighted kappa is:

$$\kappa_w = \frac{P_o - P_c}{1 - P_c} \quad (i)$$

where:  $P_o$  is the total proportion of weighted observed agreement.

$P_c$  is the total proportion of weighted chance agreement.

When calculating weighted kappa for a series of observations by two raters on some rating scale with  $X$  points per item, a  $X$  by  $X$  matrix of observations can be constructed. Equation (i) can then be rewritten as

$$\kappa_w = \frac{\sum w_{ij} P_{oij} - \sum w_{ij} P_{cij}}{w_{max} - \sum w_{ij} P_{cij}} \quad (ii)$$

where:  $w_{ij}$  is the agreement level assigned the cell in row  $i$  and column  $j$  of the matrix of observations.

$P_{oij}$  is the proportion of observations in that cell.

$P_{cij}$  is the proportion expected by chance in that cell.

The agreement level, or weight  $-w-$  of each cell is determined by the experimenter, depending on the significance of the level of agreement between various cells. Perfect agreement occurs when both raters choose the same point of the item, and is represented in the matrix by the diagonal cells. This procedure of differential weighting is particularly valuable in the diagnostic situation, as illustrated by Spitzer *et al.* (1967).

In applying weighted kappa to rating scales, some method of prior determination of weights must be adopted. Cohen (1968) pointed out that under certain conditions  $\kappa_w = r$  (product moment correlation). The relevant condition is that disagreement weights should be assigned so as to be proportional to the square of the disagreement level. It is not, however, necessary to adhere to quadratic weighting, as Spitzer *et al.* (1967) show, nor does such weighting relate to the psychological significance of disagreements at different levels. If quadratic disagreement weights were employed, on a rating scale with item categories 1, 2, 3, 4, then the diagonal cell 1-1 of the matrix would have a weight of 0 (perfect agreement), cell 1-2 a weight of 1, and cell 1-3 a weight of  $2^2(4)$ . Assume the second rater was initially uncertain whether to rate 1 or 3, but finally chose 2. The consequences of rating 1 would then alter the weight by 1, but if he rated 3, the weight would alter by 3. An equi-probable error by the rater in this situation would lead to unequal weight re-allocation. It is therefore safer to adopt linear or equal weight intervals in the absence of information about total score distributions. It is thus suggested that weights for rating scales should be directly proportional to the points difference between raters on an item. The adoption of linear weights would also permit direct comparison of weighted kappa coefficients from different sets of data, since comparisons cannot be made without knowledge of the weighting system employed.

There are two important points in the numerical determination of weights. There are two methods of allocating weights, as already indicated above, depending on whether *agreement* or *disagreement* is weighted. The equations presented here all employ weighted agreement, but disagreement equations can also be used (see Everitt, 1968). When referring to equations for weighted kappa, it is important to check which method is being used, especially if the variance will be required later. Secondly, if the variance is to be calculated it is important to assign the weights so that maximum agreement has a weight of 1, and maximum disagreement a weight of zero. While the value of weighted kappa itself is unaffected by multiplication by a constant, the

variance is affected. Thus exceeding a maximum weight of 1 may lead to confusion in subsequent calculation of the variance, and will in any event require recalculation of  $P_o$  and  $P_e$  when calculating the variance. For example, in a 4 by 4 matrix the possible levels of agreement are: no difference, 1 point difference, 2 points difference; 3 points difference. The linear agreement weights would then be 3, 2, 1, 0 respectively, or 1, 0.667, 0.333, and 0 when transformed to a maximum of 1.

The proportion observed in each cell —  $P_{oij}$  — is simply the frequency per cell expressed as a proportion of all observations. The chance proportion —  $P_{cij}$  — in each cell is calculated by multiplying the two marginal frequencies,  $P_i$  and  $P_j$ , for that cell, and expressing that product as a proportion of the square of all observations.

#### Example

Fig. 1 shows a set of hypothetical observations and weights on a three-point item for 100 patients by two raters, A and B.

|                               |   | Rater B |        |        | Row frequency<br>( $P_i$ ) |
|-------------------------------|---|---------|--------|--------|----------------------------|
|                               |   | 0       | 1      | 2      |                            |
| Rater A                       | 0 | 65(1)   | 3(0.5) | 2(0)   | 70                         |
|                               | 1 | 4(0.5)  | 10(1)  | 6(0.5) | 20                         |
|                               | 2 | 1(0)    | 2(0.5) | 7(1)   | 10                         |
| Column frequency<br>( $P_j$ ) |   | 70      | 15     | 15     | 100                        |

FIG. 1.—Observations and weights on 100 patients.

For cell 0-0,  $w = 1$  (exact agreement)

$$P_o = \frac{65}{100} = 0.65$$

$$P_e = \frac{70 \times 70}{100 \times 100} = 0.49$$

For cell 2-1,  $w = 0.5$  (difference of 1 point)

$$P_o = \frac{10}{100} = 0.10$$

$$P_e = \frac{15 \times 10}{100 \times 100} = 0.015$$

The final matrix of  $w$ ,  $P_o$ , and  $P_e$  will be as shown in Fig. 2.

|         |   | Rater B |       |       |                                                                               |
|---------|---|---------|-------|-------|-------------------------------------------------------------------------------|
|         |   | 0       | 1     | 2     |                                                                               |
| Rater A | 0 | 0.65    | 0.03  | 0.02  | In each cell, the figures are arranged:<br>$P_{oij}$<br>$w_{ij}$<br>$P_{cij}$ |
|         | 1 | 0.49    | 0.105 | 0.105 |                                                                               |
|         | 2 | 0.04    | 0.10  | 0.06  |                                                                               |
|         | 1 | 0.5     | 1     | 0.5   |                                                                               |
|         | 2 | 0.14    | 0.03  | 0.03  |                                                                               |
|         | 2 | 0.01    | 0.02  | 0.07  |                                                                               |
|         | 2 | 0.07    | 0.015 | 0.015 |                                                                               |
|         |   |         |       |       |                                                                               |

FIG. 2.—Probabilities and weights for 100 patients.

Then:

$$P_o (\sum w_{ij} P_{oij}) = 0.65 + 0.10 + 0.07 + (0.5 \times 0.06) + (0.5 \times 0.04) + (0.5 \times 0.03) + (0.5 \times 0.02) = 0.895$$

$$P_e (\sum w_{ij} P_{cij}) = 0.49 + 0.03 + 0.015 + (0.5 \times 0.14) + (0.5 \times 0.105) + (0.5 \times 0.03) + (0.5 \times 0.015) = 0.68$$

Substituting in equation (ii),  
 $0.895 - 0.68$

$$\kappa w = \frac{1 - 0.68}{0.895 - 0.68} = +0.688$$

Weighted kappa varies from +1 (perfect positive agreement) through 0 (chance agreement) to -1 (perfect negative agreement), and thus may be interpreted like a correlation coefficient.

#### Variance of weighted kappa

The significance of a given weighted kappa coefficient can be assessed from the variance of the coefficient. The variance of weighted kappa can be used in setting confidence limits, or in comparing two independent values of weighted kappa. The equation for the estimate large sample variance of weighted kappa, as derived by Fleiss *et al.* (1969), is:

$$\text{Variance } (\kappa w) = \frac{1}{N(1 - P_e)^4} \left\{ \sum P_{ij} [w_{ij}(1 - P_e) - (\bar{w}_i + \bar{w}_j)(1 - P_o)]^2 - (P_o P_e - 2P_e + P_o)^2 \right\} \quad (\text{iii})$$

This formidable equation can be broken down so the calculation can be carried out in a series of steps.



- Step 1. Insert for each cell, entry a, which is the weight  $-w-$  for that cell.
- Step 2. Insert cell entry b, which is the observed proportion  $-P_{ij}-$  of observations.
- Step 3. Insert cell entry c, which is the chance proportion  $-P_{ej}-$  of observations.
- Step 4. Calculate and insert the weighted average of the weights in each row  $-\bar{w}_i-$  and in each column  $-\bar{w}_j-$ . This is done for each row by calculating for each cell in a row the product of the cell weight (entry a) and the marginal proportion of observations for that column  $-P_j-$  and summing the products. The procedure is repeated with the columns of cells and the row marginal proportions to give the column result.
- Step 5. Calculate and insert cell entry d, which is the sum of the row and column weighted average weight  $(\bar{w}_i + \bar{w}_j)$  for the cell.
- Step 6. Calculate and insert cell entry e, which is, for each cell  $[\text{entry a} \times (1 - P_e) - \text{entry d} \times (1 - P_o)]^2$ .  $P_o$  and  $P_e$  are obtained directly from the original calculation of  $\kappa w$ , and are constant for every cell.
- Step 7. Calculate for each cell the product of entry b and entry e, and sum all the products. This sum represents the expression  $\sum P_{ij}[w_{ij}(1 - P_e) - (w_i + w_j)(1 - P_o)]^2$  in equation (iii) (Quantity A).
- Step 8. Calculate  $(P_o P_e - 2P_e + P_o)^2$  from the values obtained in calculating  $\kappa w$ . (Quantity B).
- Step 9. Calculate  $\frac{1}{N(1 - P_e)^4}$  from the value of  $P_e$  obtained in calculating  $\kappa w$  and  $N$  from the total number of observations (Quantity C).
- Step 10. Substituting in equation (iii),
- $$\text{Variance } (\kappa w) = C(A \cdot B)$$

#### Example

Fig. 3 shows the set of cell and other entries for the data on Fig. 1. Illustrations of the above steps are given below.

| Cell    |       | Rater B |        |       |       |  |
|---------|-------|---------|--------|-------|-------|--|
| entry   | 0     | 1       | 2      | $P_i$ | $w_i$ |  |
| a       | 1.0   | 0.5     | 0      |       |       |  |
| b       | .65   | .03     | .02    |       |       |  |
| c       | .49   | .105    | .105   | .70   | .775  |  |
| d       | 1.575 | 1.375   | .975   |       |       |  |
| e       | .0239 | .00024  | .01051 |       |       |  |
| f       | .3306 | .7656   | .9506  |       |       |  |
|         |       |         |        |       |       |  |
| Rater A | a     | 0.5     | 1.0    | 0.5   |       |  |
|         | b     | .04     | .10    | .06   |       |  |
|         | c     | .14     | .03    | .03   | .20   |  |
|         | d     | 1.375   | 1.175  | .775  |       |  |
|         | e     | .00024  | .0387  | .0062 |       |  |
|         | f     | .7656   | .0306  | .0756 |       |  |
|         |       |         |        |       |       |  |
| 2       | a     | 0       | 0.5    | 1.0   |       |  |
|         | b     | .01     | .02    | .07   |       |  |
|         | c     | .07     | .015   | .015  | .10   |  |
|         | d     | 1.025   | .825   | .425  |       |  |
|         | e     | .0116   | .0054  | .0758 |       |  |
|         | f     | 1.0506  | .1056  | .3306 |       |  |
|         |       |         |        |       |       |  |
| $P_j$   | .70   | .15     | .15    | 1.00  |       |  |
| $w_j$   | .80   | .60     | .20    |       |       |  |

Fig. 3.—Cell entries to illustrate calculation of the variance of weighted kappa from data of Fig. 1.

Step 4. For the first row of Fig. 3, the weighted average weight is  $(1 \times .70) + (0.5 \times .15) + (0 \times .15) = .775$ .

Step 5. For cell 0-1, the sum of the row and column weighted average weights is  $(.775 + .60) = 1.375$  (cell entry d).

Step 6. For cell 1-2, the figure is  $[0.5 \times (1 - .68) - 0.775 \times (1 - .895)]^2 = 0.0062$  (cell entry e)  
Quantity A = 0.025167

Step 8. Quantity B =  $[(.895 \times .68) - (2 \times .68) + .895]^2 = 0.025167$

Step 9. Quantity C =  $\frac{1}{100(1 - .68)^4} = 0.95420$

Step 10. Variance ( $\kappa w$ ) = 0.004502

In most practical situations weighted kappa is required to be relatively large, so it is usually of little practical significance to demonstrate that a particular value of weighted kappa is, statistically speaking, significantly different from 0. However a further equation, also derived by Fleiss *et al.* (1969) may be

used to estimate the variance under the hypothesis that the value of weighted kappa is 0, and this may then be used for significance testing.

$$\text{Variance}_0(\kappa_w) = \frac{1}{N(1-P_c)^2} \left\{ \sum p_i p_j [w_{ij} - (\bar{w}_i + \bar{w}_j)]^2 - P_c^2 \right\} \quad (\text{iv})$$

This may be calculated by extending the previous multiple-step calculations.

Step 11. Calculate and insert cell entry *f*, which is the square of the difference between entry *a* and entry *d* for each cell.

Step 12. Calculate for each cell the product of entry *c* and entry *f*, and sum all the products. This sum represents the expression  $\sum p_i p_j [w_{ij} - (\bar{w}_i + \bar{w}_j)]^2$  in equation (iv) (Quantity D).

Step 13. Calculate  $P_c^2$  from value obtained (Quantity E)

Step 14. Calculate  $\frac{1}{N(1-P_c)^2}$  from values obtained (Quantity F)

Step 15. Substitution in equation (iv),  
Variance<sub>0</sub>( $\kappa_w$ ) = F(D-E)

#### Example

Step 11. For cell 2-0 in Fig. 3 (entry *a*—entry *d*)<sup>2</sup> is  $(0 - 1.025)^2 = 1.0506$  (cell entry *f*).

Step 12. Quantity D = 0.53268.

Step 13. Quantity E =  $(.68)^2 = 0.46240$ .

Step 14. Quantity F =  $\frac{1}{100(1-.68)^2} = 0.097754$ .

Step 15. Variance<sub>0</sub>( $\kappa_w$ ) = 0.006863.

A practical example of the use of weighted kappa in this way is based on data collected during a token economy study with long-term psychiatric patients. Every week twelve male chronic schizophrenic patients were rated on a 12-item 5-point rating scale (a modification of Wing's (1961) scale), and every 4 weeks the rating was carried out independently by 2 trained nurses, both with previous experience and supervision in use of the scale. Thus every 4 weeks 144 separate items were rated independently, and the matrix of figures resulting for one given week is shown in Fig. 4, together with the weights for each cell. Note especially the high frequency of category 0 for both raters, and the distribution of disagreement.

|               |   | Rater R.A. |         |        |        |        | Marg.<br>freq. |
|---------------|---|------------|---------|--------|--------|--------|----------------|
|               |   | 0          | 1       | 2      | 3      | 4      |                |
| Rater<br>G.R. | 0 | 70(1)      | 11(.75) | 1(.5)  | 0(.25) | 1(0)   | 83             |
|               | 1 | 1(.75)     | 9(1)    | 1(.75) | 0(.5)  | 0(.25) | 11             |
|               | 2 | 5(.5)      | 5(.75)  | 14(1)  | 1(.75) | 0(.5)  | 25             |
|               | 3 | 0(.25)     | 2(.5)   | 4(.75) | 0(1)   | 1(.75) | 7              |
|               | 4 | 0(0)       | 1(.25)  | 6(.5)  | 2(.75) | 9(1)   | 18             |

Marginal

frequency 76 27 26 3 11 144

FIG. 4.—Observations and weights on 12 patients with 12-item scale.

This matrix of figures gave the following reliability measures. The very high total-score correlation should be noted.

$$\begin{aligned} \text{Percentage exact agreement} &= \\ &= \frac{(70+9+14+0+9)}{144} \times 100 \\ &= 71 \end{aligned}$$

$$\begin{aligned} \text{Percentage agreement } \pm 1 &= \\ &= \frac{(102+12+14)}{144} \times 100 \\ &= 89 \end{aligned}$$

Product-moment correlation: total scores = +0.98  
item scores = +0.80

Weighted kappa = +0.67

Weighted kappa can be used in this way with any rating scale, and is of particular value when any of the five assumptions mentioned in the introduction are not valid.

When inter-rater reliability checks such as this are carried out the reliability, or stability, of scores used in subsequent calculations can be increased by pooling the scores, as illustrated by Philip and McKechnie (1969).

#### CAUSES OF INTER-RATER UNRELIABILITY

There are several constraints on the upper limits of reliability that are possible with rating scales in a ward situation. As already indicated, nurse raters are often involuntarily highly selective raters, so the proportion of total patient behaviour actually observed is limited. When a second nurse rates, that nurse may be on an opposite shift. In such a situation less than an hour of their daily time on the ward may overlap, and much of that time may be spent on administrative change-over procedures. The

amount of observation time common to both nurses will then be virtually nil, and in addition the observation periods will cover different parts of the day. An analysis of the rate of disturbed behaviour displayed by an individual patient in the token economy study mentioned did indeed show highly significant variations at different times of the day. Apparent unreliability may therefore be due, not to defects of the rating scale, but to the sporadic nature of the rated behaviour and to the system of ward staffing.

Other factors leading to poor reliability may be related to the construction of the scale. Thus, examination of the Wing (1961) ward scale indicates that the 12 items may be classified in two ways: firstly, by whether the *positive* occurrence of some event leads to a 'normal' rating, or to an 'abnormal' rating; secondly, by whether a specified rate of occurrence is mentioned in the item. Fig. 5 shows how the

|                                 | Occurrence<br>of event<br>is normal | Non-<br>occurrence<br>of event<br>is normal |
|---------------------------------|-------------------------------------|---------------------------------------------|
| Specified rate of occurrence    | 11, 12                              | 7, 8, 9, 10                                 |
| No specified rate of occurrence | 1, 2, 4, 5, 6                       | 3                                           |

FIG. 5.—Analysis of Wing scale items.

12 items may be classified in these ways. Items 3, 7, 8, and 9 together form the socially embarrassing (S.E.) factor, which Wing (1961) noted to be less reliable than the social withdrawal (S.W.) factor made up of the other eight items. It can be seen that all four S.E. items are so presented that non-occurrence of an item leads to a 'normal rating'.

If a chronic patient were now to be moved from a large long-stay ward to a smaller rehabilitation ward, with a better staff-patient ratio, the probability of observation of patient behaviour would be increased. This means that S.E. items might then be rated as more deviant, while on the other hand S.W. items would tend to be rated as improved. On purely artifactual grounds an improved staffing ratio could accordingly lead to a deterioration in the S.E. factor and an improvement in the S.W. factor. This interpretation is in fact the best explanation

of data observed in an earlier token economy study (Baker, Hall and Hutchinson, 1974), where, in the reverse situation, transfer from a small to a larger ward led to a sudden and marked improvement in S.E. scores. It is therefore necessary that the likely effect on rating scales of different staffing ratios, or more precisely the effect of different levels of available observation time per patient should be carefully examined.

Fig. 5 also indicated that 6 items, including 3 of the 4 S.E. items, specify precisely the rate of occurrence of some behaviour, all at very low daily or weekly levels. While there are apparent advantages in recourse to an exact specification, it is possible, as already discussed, for low-probability behaviour to occur during the absence of one rater. The reliability of such items can therefore be improved by maintaining a complementary item check list, completed by every nurse whenever the specified behaviour occurs. When rating is carried out, examination of this check list by both raters eliminates at least one source of unreliability in those items.

Another factor of importance in obtaining good reliability is the duration of the observation period upon which ratings are based. Ratings based on observations over a long period of time suffer from two major deficiencies. Firstly, the patient may change considerably, so that there is no satisfactory 'average' figure that describes the patient during the specified period. Secondly, the detailed information required to make the rating may not be retained accurately by the nurse. Where observation periods are immediately adjacent, as in successive weekly assessments, it may be difficult to recall whether events recalled as at the beginning of the week in fact happened at the end of the previous week. It is therefore essential that scales should include an exact specification of the duration of the observation period preceding the rating. Where nursing staff are used as raters this period should not exceed one week. Rating scales should not be used more frequently than the specified observation period, since then there would be overlap of successive observation periods, and the ratings would not be independent of each other.

## SUMMARY

1. Rating scales are useful devices for assessing patients, but their reliability is partly dependent on the situation in which they are used. When used in a ward situation, as opposed to an interview situation, several factors act together to reduce inter-rater reliability.

2. When choosing a method of calculating reliability, it may be necessary to assume that: (a) scores are distributed normally; (b) agreement is meaningful; (c) chance agreement is negligible; (d) total scores are meaningful; (e) mean scores of both raters are similar.

3. If these assumptions are not valid, the statistic weighted kappa may be applied. With a particular method of weighting it may be applied to any rating scale. The statistic is simple to calculate, and its variances may be calculated by a multiple-step operation.

4. Some comments are made on how to improve the reliability of ward rating scales, with particular reference to the construction of items of the scales.

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## Process Variables and the Prediction of Outcome in Behaviour Therapy

By A. M. MATHEWS, D. W. JOHNSTON, P. M. SHAW and M. G. GELDER

Variables measured before or during psychological treatment may be used in several related ways: as an empirical guide to prognosis with any given treatment, as a means of studying possible treatment mechanisms, or as a method of identifying which stage or process in treatment is associated with therapeutic change. Using data from the same patients already described in a recently published study (Gelder *et al.*, 1973), questions of relevance to each of these areas will be examined in turn.

### Part 1: Pre-treatment Variables

Reviewing a large number of studies involving different varieties of psychotherapy, Luborsky *et al.* (1971) conclude that factors associated with good outcome include less severe pathology (other than expressed distress), strong motivation to change, and high expectations of treatment, as well as certain therapist and treatment variables. In the field of behaviour therapy, particularly where standardized treatments are used in experimental studies, both more accurate prediction and more rigorous testing of hypotheses should be possible. In fact, relatively few investigations have examined such questions, and evidence of consistent results is even less common, although some consistency is apparent in a series of studies concerned with desensitization of phobias (Gelder, Marks and Wolff, 1967; Lader *et al.*, 1967; Marks, Gelder and Edwards, 1968; Marks, Boulougouris and Marset, 1971). In these reports it was suggested that a number of features predicted poor outcome to desensitization, including the diagnosis of agoraphobia and the presence of high levels of anxiety or other complicating symptoms. However, the correlations obtained only approached satisfactory levels of significance, and an attempt to cross-validate a prognostic questionnaire

based on the results was only partially successful. In the most recent study (Marks, Boulougouris and Marset, 1971) significant correlations were again reported between ratings of anxiety before treatment and poor short-term outcome of desensitization, while with flooding similar correlations tended to be in the reverse direction. Apparent differences also emerged on some other variables, including extraversion (higher scorers did better with desensitization) and measures of physiological reactivity (low reactors did better with desensitization).

The hypotheses to be examined here can be summarized as follows, the stronger hypotheses appearing first:

1. The outcome of desensitization will be less good in patients who are agoraphobic or highly anxious.
2. In the case of other treatments (e.g. flooding) outcome will not be related to anxiety or agoraphobia in the same way.
3. Measures which reflect the spread or severity of symptoms, poor motivation or low expectations concerning treatment will be associated with poor outcome.
4. On measures of personality, good outcome will be associated with evidence of general adequacy of functioning and stability, irrespective of treatment.

In the trial reported earlier (Gelder *et al.*, 1973) 36 patients, including 18 agoraphobics, were assigned randomly to one of three treatments (desensitization, flooding, and non-specific control treatment), to one of three therapists and to one of two expectancy conditions, within the constraints necessary to maintain a balanced factorial design. Since the attempt to manipulate expectancy using interview and video-tape was unsuccessful, and since there were few significant therapist effects,





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the results may be summarized by stating that flooding and desensitization relieved phobic symptoms more effectively than the non-specific treatment. This difference between treatments was more marked in the case of the agoraphobic patients, who were not helped by the non-specific treatment, but there was no convincing evidence that agoraphobics responded differently from patients with other phobias to desensitization or flooding, nor that flooding was more effective than desensitization with agoraphobia, as had been reported by Marks *et al.* (1971).

#### *Selection of outcome criterion*

A large number of measures were obtained before and after treatment, most of which concerned some aspect of phobic behaviour or anxiety. Sixty variables, expressed in terms of either simple change scores or improvement ratings, were submitted to a principal component analysis in the hope that a single general improvement factor would emerge, which could be used as a guide to the selection of representative outcome measures. The first factor emerging from the analysis accounted for only 13 per cent of the total variance, but could nevertheless be identified confidently as a general improvement factor. The two variables which loaded most highly on it were change in main phobia, assessed independently (loading .26), and overall rating of improvement by the patient (loading .24). The ten measures which loaded most highly on this factor are shown in Table I, together with their inter-correlations.

It seems reasonable to consider these two most highly loading variables as representative scores when making an overall assessment of change, as seen by an independent assessor and by the patient himself. The next five measures also derived from ratings or questionnaire responses made by the patient, and the arbitrary decision was made to give preference to the next most highly loading measure, as it was considered that this could add different and possibly more objective information to the first two measures. This was the score derived from the number of hierarchy gains made on post-treatment behavioural testing. As can be seen from Table I all three selected outcome measures were highly inter-correlated.

#### *Analysis*

Values of these three chosen variables were placed in rank order from most to least change, separately within each treatment. Ranks of the three measures were then added together for each individual patient and a final rank order determined by the sum. It was then possible to divide each treatment group of twelve patients into the six showing greater than average overall change and the six showing less than average overall change. This division was carried out first with scores obtained immediately after treatment, and secondly with those at follow-up, which in some cases was slightly different. The division of patients into sub-groups showing greater or less than average gains within each treatment group allowed the use of analysis of variance to test for pre-treatment differences between responding and non-responding

TABLE I  
*Factor loadings and intercorrelations for ten measures of change at the end of treatment*

| Change scores                         | Loading | 1    | 2    | 3    | 4    | 5   | 6    | 7   | 8   | 9   | 10 |
|---------------------------------------|---------|------|------|------|------|-----|------|-----|-----|-----|----|
| 1. Main phobia (independent assessor) | .26     | —    |      |      |      |     |      |     |     |     |    |
| 2. Patients rating of improvement ..  | .24     | .67* | —    |      |      |     |      |     |     |     |    |
| 3. Semantic differential 'symptom' .. | .23     | .58* | .53* | —    |      |     |      |     |     |     |    |
| 4. Summed hierarchy ratings ..        | .23     | .76* | .71* | .65* | —    |     |      |     |     |     |    |
| 5. 16 P.F. anxiety score ..           | .21     | .28  | .22  | .42* | .15  | —   |      |     |     |     |    |
| 6. Patients rating of 'tension' ..    | .20     | .42* | .34  | .27  | .32  | .19 | —    |     |     |     |    |
| 7. F.S.S. agoraphobia score ..        | .19     | .46* | .39  | .33  | .21  | .27 | .20  | —   |     |     |    |
| 8. Behavioural test gains ..          | .19     | .55* | .52* | .37  | .68* | .17 | .43* | .25 | —   |     |    |
| 9. F.S.S. social fears score ..       | .18     | .29  | .30  | .24  | .39  | .35 | .17  | .30 | .30 | —   |    |
| 10. Resting heart rate ..             | .18     | .17  | .30  | .21  | .26  | .18 | .27  | .22 | .31 | .11 | —  |

\* Significant at the 1 per cent level of confidence.



patients, irrespective of treatment or within particular treatments. All pre-treatment symptom ratings, questionnaire scores and physiological variables were submitted to analysis of variance for both post-treatment and follow-up outcome sub-groupings.

### RESULTS

Based on scores obtained immediately after treatment, there were overall significant differences between more-improved and less-improved groups with twelve of the variables measured before treatment. Results are shown in Table II, but since a large number of F tests were performed only those found to be significant at the 1 per cent level of confidence are considered in detail. Extraversion and traits apparently related to it are the only variables consistently distinguishing between improvement groups. Of the five results significant at the 1 per cent level only two, E.P.I. extraversion and 16 P.F. 'outgoing', also predict outcome significantly at follow-up.

However, the most striking findings are negative. For example, it had been expected that the severity or spread of symptoms, high anxiety, high neuroticism, low expectancy, low rated motivation for treatment and low therapist expectancy of success would—among others—predict poor outcome; but none of these hypotheses were adequately confirmed. There was a trend for high trait anxiety, self-rated depression and poor social adjustment to be related to poor

outcome, but for none of these did the relation reach a highly significant (1 per cent) level of confidence.

Turning to the possibility that different patients would respond best to the individual treatments, the results are even less in line with prediction. The first analysis of the data (Gelder *et al.*, 1973) failed to show that the diagnosis of agoraphobia was associated with better response to flooding than to desensitization. In the present analysis only one measure of anxiety differentiated treatment response at the 5 per cent level (16 P.F., Q4 'tension'), and this result was not in the predicted direction, since the more 'tense' patients did better with desensitization. None of the clinical ratings of anxiety which had been expected to predict a better response to flooding did so. The single variable which is differentially related to improvement with each treatment at the 1 per cent level was factor N on the 16 PF (shrewdness): high scores were associated with good outcome of desensitization, a result both unexpected and difficult to interpret.

### DISCUSSION

None of the hypotheses put forward on the basis of earlier work proved robust enough to withstand cross-validation using a different design and analysis. On the basis of the present findings it would seem premature to propose that the presence of high levels of anxiety, diagnosis of agoraphobia, or severity of other symptoms constitute a clear indication for

TABLE II  
*Mean pre-treatment scores for more-and less-improved groups at end of treatment and follow-up*

| Pre-treatment measure          | End of treatment |               |       | Follow-up     |               |       |
|--------------------------------|------------------|---------------|-------|---------------|---------------|-------|
|                                | More-improved    | Less-improved | 'F'   | More-improved | Less-improved | 'F'   |
| E.P.I. extraversion score ..   | 14.8             | 9.4           | 22.2* | 14.4          | 10.2          | 11.5* |
| 16 P.F. 'venturesome' ..       | 5.4              | 3.1           | 15.4* | 5.0           | 3.4           | 5.4   |
| 16 P.F. extraversion score ..  | 5.4              | 3.3           | 14.1* | 5.1           | 3.6           | 5.9   |
| 16 P.F. 'happy-go-lucky' ..    | 6.7              | 4.6           | 12.3* | 6.4           | 4.8           | 6.6   |
| 16 P.F. 'outgoing' ..          | 5.7              | 4.1           | 8.5*  | 5.7           | 4.1           | 8.6*  |
| E.P.I. lie score ..            | 0.9              | 2.1           | 5.8   | 1.0           | 2.1           | 4.9   |
| Self-dissatisfaction rating .. | 2.2              | 3.1           | 4.8   | 2.2           | 3.1           | 5.1   |
| 16 P.F. anxiety score ..       | 7.2              | 8.7           | 4.5   |               |               | N.S.  |
| Self rating of depression ..   | 8.3              | 14.9          | 4.4   |               |               | N.S.  |
| Impairment of leisure ..       | 2.0              | 2.9           | 4.2   |               |               | N.S.  |

\* Significant at the 1 per cent level of confidence. All results shown are significant at the 5 per cent level

flooding treatment in phobic patients. Nor was there evidence for the value of interview data in making predictions about outcome. The single result that may be of some use, if it can stand up to cross-validation, is that a moderate degree of extraversion may predict improvement in phobic patients, irrespective of treatment. The results of Gelder *et al.* (1973) showed that a certain amount of the variance in outcome could be attributed to the treatment used, since in agoraphobic patients both flooding and desensitization tended to be more effective than non-specific treatment. It is equally clear that a very large amount of the variance in response cannot be attributed to the treatment used, but neither can it be attributed to any great extent to the variables we measured before treatment began.

### Part 2: Within-Treatment Variables

All patients in the study reported by Gelder *et al.* (1973), received 15 sessions of treatment, of which the first three were fact-gathering and orientation interviews; in the next eight sessions one of the imaginal procedures (free association, desensitization or flooding) was applied, and in the last four sessions the appropriate *in-vivo* practice procedure was used.

At the beginning of each session the therapist questioned the patient about the week's events, and made a rating of anxiety, depression and anger, based on the patient's report. Patients were then asked to make ratings on two semantic differential forms, 'Myself as I am' and 'Myself as I expect to be after treatment'. They also rated subjective anxiety while thinking about the worst phobic situation, and estimated the anxiety they would experience if actually in this worst phobic situation. On the second and eighth imaginal treatment session polygraphic recordings were made of the patient's physiological reactions to imagery.

#### Autonomic activity

Physiological measures were used to investigate (a) whether autonomic activity was the predicted function of treatment and (b) whether reactivity in treatment sessions predicted out-

come. It was anticipated that early in flooding sessions there would be a marked increase in physiological activity levels, that in desensitization sessions there would be steady decreases in activity, with non-specific treatment (free association) having an intermediate effect. Subsequent treatment sessions might be supposed to show a general reduction of activity and an elimination of the initial increase in flooding sessions. This prediction was based on the idea that flooding may work by inducing an anxiety peak early in treatment which is reduced by processes of extinction or exhaustion under conditions of massed presentation. It might follow that patients exhibiting such a peak—followed by a decline—also have a good eventual outcome.

Heart rate and skin conductance level of all patients were monitored using a Grass 7 Polygraph throughout sessions 5 and 11 (i.e. imaginal treatment sessions 2 and 8). Details of the measures are given by Gelder *et al.* (1973). Recordings were sampled every five minutes for the first half hour, and the scores were submitted to a repeated-measure analysis of variance to examine effects due to treatments, therapists, occasions and also trends within sessions. The analysis of trend has the effect of partitioning variance due to occasions into components corresponding to linear, quadratic or cubic trends within each session, thus testing the extent to which the changes over time can be accounted for by these simple functions. All results are expressed using the convention ( $F_{x,y} = z, P < .01$ ), where  $z$  is the variance ( $F$ ) ratio, with degrees of freedom  $x$  and  $y$ . Because of the large number of observations, only results significant at the 1 per cent level of confidence are reported.

### RESULTS

During session 5 there were no significant overall differences in heart rate due to treatments or therapists. There was, however, a significant effect of occasions within the session ( $F_{5,116} = 4.1, p < .01$ ), and a therapist by occasions interaction ( $F_{10,116} = 3.1, p < .01$ ). Trend analysis showed that there was a significant linear component which contributed to the occasions effect ( $F_{1,116} = 10, p < .01$ ). Inspec-

tion of the results indicates that heart rate decreased over time in general but showed a rise in the first ten minutes. The treatment by occasions interaction has a significant quadratic component ( $F_{1,116} = 13.6$ ,  $p < .01$ ) associated with peaking in the flooding group (see Fig. 1). This finding was checked by analysing the maximum value of heart rate reached, in an analysis of covariance with heart rate at time zero as the covariate. There was a significant effect of treatments, and 't' tests showed the maximum was significantly greater in the flooding than in either of the other groups (flooding versus desensitization,  $t = 2.4$ ,  $p < .05$ ; flooding versus control,  $t = 2.8$ ,  $p < .02$ ). In the case of the therapist by occasions interaction only the linear trend was significant ( $F_{10,116} = 22$ ). It appears that the patients of two of the three therapists showed little decline over time, whereas there was a marked decline in the heart rate of patients of the third therapist. On session 11, despite a tendency for heart rate to be lower overall in desensitization, the only finding that approached

the 1 per cent level of significance was an occasions effect ( $F_{5,127} = 3$ ,  $p < .02$ ). Trend analysis shows only the linear component to be significant ( $F_{1,127} = 11$ ,  $p < .01$ ) and inspection of the results indicates that heart rate declined with time (Fig. 2).

Analysis of the mean skin conductance level during session 5 showed that only the linear trend component of an occasions by therapist interaction was significant ( $F_{1,120} = 14$ ). The linear component is probably due to the decrease in conductance with time in patients treated by one therapist and an increase in patients of the other two.

On session 11 there was only a significant occasions effect ( $F_{1,105} = 14.5$ ,  $p < .01$ ), and a trend analysis shows there to be a linear increase in conductance over time ( $F_{1,105} = 65$ ).

In general it does not seem that skin conductance levels were obviously related to the type of treatment, but there was evidence that changes in heart rate differ according to the procedures used and do so in the predicted direction. An attempt to relate the HR increase

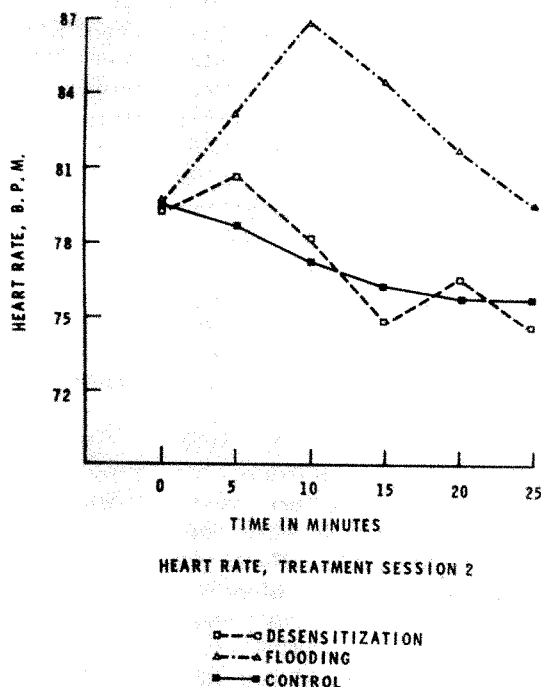


FIG. 1.—Mean heart rate scores at five minute intervals for each treatment group during session 5.

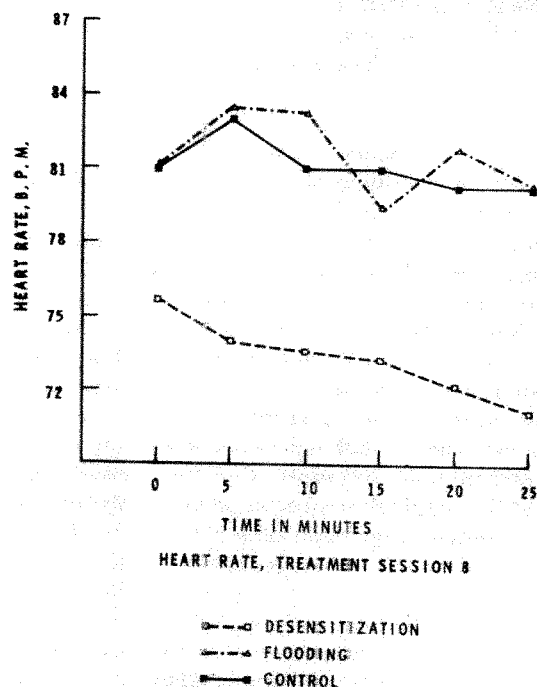


FIG. 2.—Mean heart rate scores at five minute intervals for each treatment group during session 11.

or its later decline to subsequent clinical improvement (using ANOVA as in Part 1) was not successful. There were no significant differences in heart rate response between more and less improved patients.

#### *Mood state*

Ratings of mood were based on the therapist's judgement after hearing the patient's account, and in each case (anxiety, depression or anger) the ratings took the form of a four-point scale; absent (0), slight (1), moderate (2) or extreme (3). Predictions were made based on possible mechanisms of treatment: it was expected that flooding might increase negative feelings, especially at first, while desensitization might reduce anxiety throughout treatment.

Ratings of patients' anxiety, depression and anger by the therapist were analysed overall by repeated-measure analysis of variance, and on each occasion (i.e. treatment session) by non-parametric median tests. At no point were mood ratings significantly different among treatment groups; there was no evidence of increases in depression, anxiety or anger during flooding treatment, nor was there evidence that general anxiety was reduced earlier in desensitization than in the other treatments.

#### *Semantic differential*

Scores for 'Myself as I am' and 'Myself as I expect to be after treatment' were derived from items loading on the evaluative, potency and activity factors, but in the case of the 'symptom' score, items were arbitrarily chosen as supposedly representative of phobic attitudes, i.e. 'unable to go anywhere with confidence', 'has many fears or worries' and 'easily upset'. This symptom scale was significantly related to other main outcome measures (Table I) so that it could be used as a within-treatment measure of general reduction in phobic attitude. No precise predictions were made, and the measure was used simply to search for evidence of changes related to the different stages of treatment. The semantic differential form for 'Myself as I expect to be after treatment' was included to check whether unrealistic expectations of change were modified as the treatment went on, and if so at what point. Unexpectedly, the scores on

this concept did not substantially change through treatment, so that by the end a very large discrepancy remained between the two semantic differential concepts. Clearly patients were not realistically rating their expectations. They appeared to be rating their hopes of an ideal end-of-treatment state. The evaluative, potency and activity scores for both concepts also changed very little, so that none of these measures are considered further.

Ratings on the three 'symptom' scales were summed and analysed by repeated measure analysis of variance and median tests as before. Once again no significant differences between treatments were found, despite the appearance of a trend downwards in the later (i.e. *in vivo*) sessions of flooding and desensitization.

#### *Phobic anxiety ratings*

At the beginning of each session patients were asked to make estimates of the anxiety they experienced when thinking about the worst possible phobic situation, and also the anxiety they might experience if actually in this worst situation (i.e. the highest items in the pre-treatment phobic hierarchy). Both ratings consisted of a number between 0 (complete calm) and 10 (complete panic). All treatments were divided into imaginal and *in vivo* exposure phases, and it seemed likely that progress in the imaginal phase would be reflected in ratings of 'anxiety when thinking about' the phobic situation, while estimates of anxiety that was expected in the real situation might be affected more by *in vivo* practice. It was also possible that change in the imaginal treatment phase would be a more successful predictor of eventual outcome than the pre-treatment measures had proved to be.

Ratings of 'anxiety when thinking about' the worst phobic situation could not be subjected to analysis of variance, as the distribution of the data was badly skewed, due to the preponderance of maximum scores (10), especially in the early treatment sessions. For this reason only median tests were used, and in practice this involved comparisons of the numbers of patients in each treatment group giving less than maximum scores at each treatment session. This comparison gave a significant Chi-squared

value at the 5 per cent level of confidence on four occasions, the earliest being at session 11, just before the end of the imaginal treatment phase. Fig. 3 shows that this is due to the steady decline in mean ratings from patients receiving either desensitization or flooding, and that this starts after session 5. On the other hand, means for patients receiving the non-specific control treatment show little change. Mean scores from patients in the desensitization and flooding groups are similar throughout treatment, and unlike the Semantic Differential scores did not obviously decline more rapidly during the *in-vivo* phase of treatment.

Thus during both imaginal desensitization or flooding and the subsequent *in-vivo* exposure there is a steady decrease in mean ratings of anxiety experienced during mental imagery which does not differ between the two behavioural treatment groups.

Turning to the anxiety anticipated in the real-life phobic situation, Fig. 4 shows that scores did not change consistently until the start of the *in vivo* exposure phase. Non-parametric median tests (using the frequency of scores which were less than the maximum) show a significant difference in favour of desensitization and flooding at session 13 (i.e. after one *in vivo* session). It seems that although anxiety 'while thinking about' was reduced in

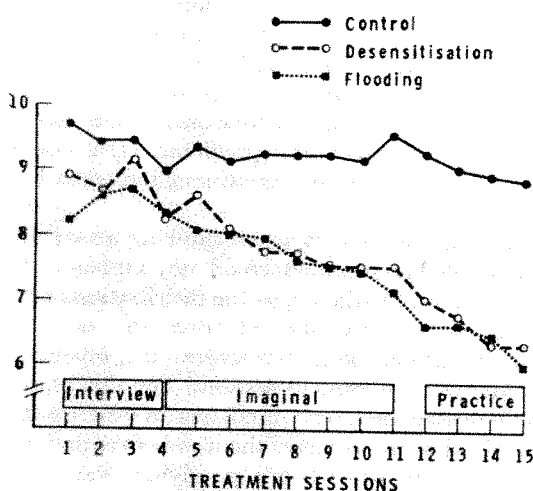


Fig. 3.—Mean scores for anxiety 'when thinking about' phobic situations for each treatment group.

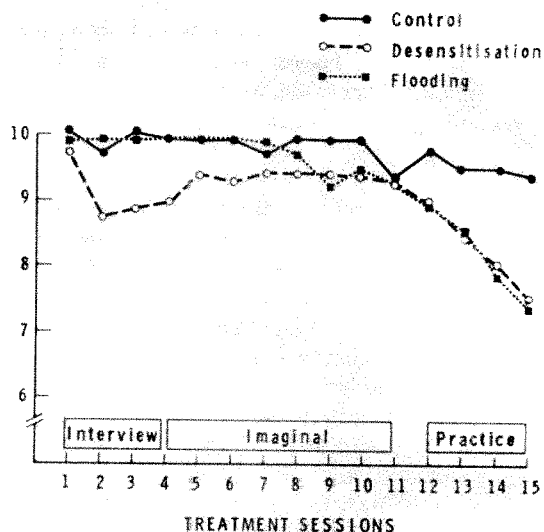


Fig. 4.—Mean scores of anxiety estimated for phobic situations 'in real life' for each treatment group.

both imaginal and *in vivo* treatment phases, anticipated 'real life' anxiety decreased only during *in vivo* treatment.

Changes during treatment in anxiety about the phobic situations were then examined for their possible relevance to outcome. Within the behaviour therapy groups, the most and least improved patients were identified in the way described previously, i.e. on the basis of independent ratings, patients' report of improvement and behaviour testing. Since no patients in the non-specific control group showed more than a slight to moderate improvement, only desensitization and flooding groups were examined. As there was no clear difference in outcome between them, results from both treatment groups were combined to form two new groups of 'improved' and 'unimproved' patients, with twelve in each group. Fig. 5 shows that the mean rating for 'improved' patients declines steadily after session 3, while the mean for 'unimproved' patients changes little. Median tests at each point showed that the difference becomes significant at session 4. Since ratings were made at the beginning of the session, it seems that patients who improved later must have recorded slightly lower ratings even before specific imaginal treatment began. A similar pattern is seen with the 'real life'

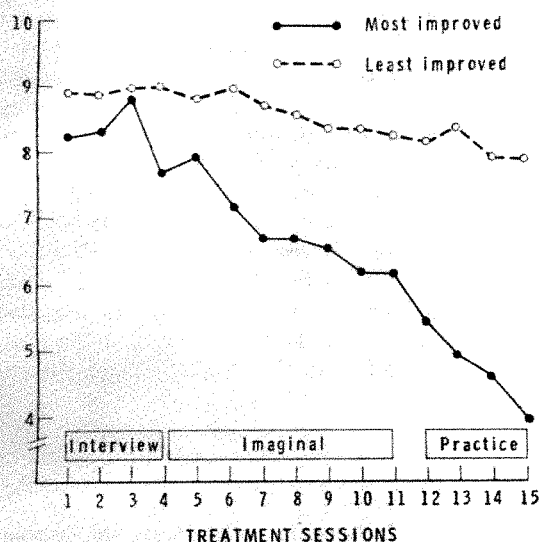


FIG. 5.—Mean scores for anxiety 'when thinking about' phobic situations for more and less improved behaviour therapy patients.

ratings (Fig. 6), where significantly more of the patients who improved later recorded less than maximum scores at the start of session 10, just before the beginning of the *in vivo* phase of treatment.

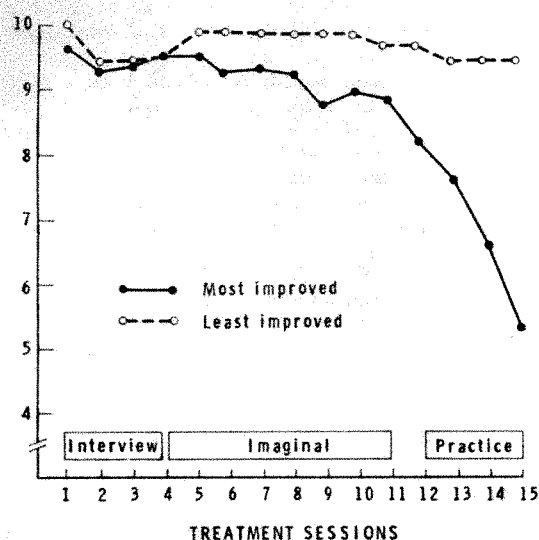


FIG. 6.—Mean scores of anxiety estimated for phobic situations 'in real life' for more and less improved behaviour therapy patients.

## DISCUSSION

Although differences in outcome between desensitization and flooding were few, there were some differences in autonomic responding during early sessions of the two treatments. Flooding was accompanied by a peak in heart rate (but not in skin conductance level) which occurred on average about 10 minutes after the start of an imaginal treatment session. After this heart rate steadily declined for the remainder of the session. However, this peak was by no means as large as might be expected from the hypothesis that excessive anxiety, induced by flooding, leads to some form of exhaustion or inhibition, since the average increase in heart rate was only about 7 to 8 beats per minute. In accordance with prediction, however, this peak disappeared after eight imaginal flooding sessions, while heart rate in desensitization tended to decrease steadily both within and across sessions. No such predicted effects were observed in skin conductance level. Both heart rate and skin conductance response differed somewhat in patients treated by individual therapists, but this did not seem to be associated with any differences in therapist effectiveness. Thus, while autonomic response is a predictable function of the treatment procedure, there is insufficient evidence that the response or its decline is a crucial process underlying the mechanisms of treatment.

Mean ratings of general mood state, made before each session, did not show systematic differences between treatments. It follows that if any of the treatments lead to some generalized emotional disturbance this is relatively transient or idiosyncratic. The Semantic Differential results suggest that phobic attitudes change more during *in vivo* treatment in the case of patients who have previously been treated with imaginal desensitization or flooding. The analysis of simple phobic anxiety ratings gave some support for this, since changes in these ratings were a function of treatment procedure; imaginal desensitization and flooding was accompanied by reduced anxiety 'when thinking about', while subsequent *in vivo* treatment was accompanied by reductions of anxiety anticipated in 'real life'. This was made clearer by separate analysis of improved and unimproved

behaviour therapy patients. Many of those rated as improved after treatment were already showing signs of this in their ratings at session 4, immediately before the imaginal treatment began, and by session 6 or 7 nearly all these patients had changed to some extent. Similarly the mean 'real-life' ratings from these same patients were reduced just before *in vivo* treatment started. This suggests that two factors are relevant to improvement: the application of an appropriate behavioural treatment such as desensitization or flooding, and some preparatory state in the patient which might be described as a 'readiness to change'. The label 'readiness to change' does not of course explain the underlying mechanism of improvement, and whatever it is it cannot be readily identified with 'expectancy' or 'motivation' since attempts were made to measure these equally unsatisfactory constructs before treatment and the derived measures failed to predict outcome.

#### SUMMARY

Variables measured before and during behaviour therapy or non-specific treatment of 36 phobic patients were examined for their possible relevance to outcome and to the processes occurring during successful treatment. Measures obtained before treatment began did not provide a useful guide to outcome, with the possible exception of high extraversion scores, which were associated with a good response, irrespective of treatment given. There was no evidence that by using the measures examined, patients could be individually allocated in advance to the treatment most likely to help them.

Flooding treatment was associated with a greater initial increase in heart rate, which disappeared after eight treatment sessions but did not seem to influence outcome. Ratings of

phobic anxiety made by patients who were improved after desensitization or flooding, declined systematically during treatment. Anxiety experienced when thinking about phobic situations showed a consistent decline after preparatory interviews were complete, but estimated anxiety in real life did not begin to decrease until immediately before the *in vivo* practice phase of treatment. The findings of significant differences between improved and unimproved groups in these measures suggests that response to the first few treatment sessions could be useful in predicting longer term changes.

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## EEG Evaluation of a Sleep Recorder

By J. JOHNSON and P. LOCKWOOD

Sleep disorders are important diagnostic and therapeutic aspects of many common psychiatric syndromes. Clinicians have to be content with the patients' own assessment of their sleep patterns, or at the best, those of a night nurse; both methods are known to be unreliable, particularly where insomnia is present (Kuper *et al.*, 1970). In a previous paper, Johnson and Kitching (1972) described a simple device for assessing the duration of sleep in ward situations. It depended upon the patient's ability to signal wakefulness by pressing a mechanical switch in response to an intermittent light stimulus throughout the night. This was considered to indicate a level of cerebral arousal compatible with wakefulness: failure to respond to the light stimulus indicated that the patient's level of cerebral arousal was lowered to the level of 'sleep'. A number of objections were anticipated, however, which might invalidate these assumptions. Most important of these were:

- (i) The intermittent occurrence of the light stimulus, every 15-20 minutes, limits the device to an approximation of the duration of sleep. The system of scoring was to assume a period of 10 minutes of sleep on either side of a missed stimulus.
- (ii) The possibility that the patient could press the mechanical switch in response to the light stimulus whilst in Stage I or even Stage II of sleep (Rechtschaffen *et al.*, 1968) without returning to wakefulness.
- (iii) The intermittent light stimulus might itself act as a disruptive stimulus to sleep, producing arousal and thus altering the sleep level.

This paper has two purposes: to answer the first criticism by evaluating the accuracy of the device in measuring the duration of sleep by comparing its assessment with quantitative assessments of sleep measured in the same subjects by the EEG; then to evaluate the

second and third criticisms by assessing the subject's reactivity to the light stimulus on different stages of sleep as recorded by the EEG. In order to make these assessments the EEG and the sleep recorder were run in parallel on the same subjects over a number of hours of induced and natural sleep.

### METHOD

Fourteen volunteer subjects were placed on a comfortable bed in the 'blacked out' recording room of the EEG Department and given nitrazepam 5 mgm. orally to facilitate the onset of sleep. The lamp of the sleep recorder was placed two feet above the subject's head so that the diffuse light from its 15-watt bulb could be seen with the eyes closed. The mechanical switch was strapped to the hand, and instructions were given to press the switch whenever the light came on. This initial series of recordings was made during the daytime on subjects sleeping with the help of the hypnotic. Intermittently the light was switched on electively to assess reactivity in the different stages of sleep. Finally, all-night records were made on three volunteer subjects without sedation. The records of sleep produced by the device and the EEG were assessed independently by the authors. The recording was carried out according to the methods described by Rechtschaffen *et al.* (1968), using silver chloride stick-on electrodes filled with Neptic jelly. Two channels were used for monitoring eye movements; the first electrode was 1 cm. above and slightly lateral to the outer canthus of one eye, and the second 1 cm. below and slightly lateral to the outer canthus of the other eye. Both electrodes were referred to the same electrode on the mastoid process, producing an out-of-phase deflection during the rapid eye movements, to avoid confusing these with the brain potentials picked up by the eye electrodes. The electromyogram was recorded from the mental and submental muscles. Three channels were used for recording the EEG: electrodes C4 and C3 to the contralateral mastoid electrode (A1 and A2) and a third channel from O1-A2 to record the alpha rhythm. Again following the criteria set out in the Rechtschaffen Sleep Manual, the paper speed used was 1.5 cm./sec., T.C. 0.3 sec., no filtering



TABLE I  
*EEG and Recorder assessment of awake-sleep time*

|             | Awake<br>mins.) | Sleep stage<br>(mins.) |       |     | Total<br>time<br>(mins.) |
|-------------|-----------------|------------------------|-------|-----|--------------------------|
|             |                 | 1                      | 2-4   | REM |                          |
| A. EEG ..   | 800             | 776                    | 1,237 | 81  | 2,894                    |
|             |                 | Total 2,094            |       |     |                          |
| B. Recorder | 1,023           | 1,871                  |       |     | 2,894                    |

below 20 Hz, pen deflection 100 uv/1.5 cm., electrode resistances below 10 Kohms at the start of the recording. For the EMG channel the pen deflection was increased to 100 uv/3 cm., which is lower than the 100 uv/5 cm. recommended, but was more feasible for recording during the waking and movement periods. The T.C. in the EMG channel was shortened to 0.1 sec. to eliminate slow artefacts. Some difficulty was experienced in the all-night recordings with the EMG electrodes, which were sometimes pulled off or affected by high voltage artefacts from the bed-clothes.

#### FINDINGS

Table I summarizes the comparison of waking-sleep time as determined by the EEG and the sleep recorder independently when run in parallel during 2,894 minutes of recording in the laboratory.

The sleep recorder underestimated the duration of sleep compared to the more accurate assessment by the EEG by 223 minutes (2,094-1,871). If the EEG is accepted as the most accurate method of assessing sleep duration, the recorder underestimates this by 10.6 per cent.

This error is in part due to the subject's ability to respond to the light stimulus in stages 1 and 2 of sleep. Table II shows the number of positive and negative responses made by pressing the switch in response to the

light stimulus in the different sleep stages and during periods of wakefulness.

Of the 51 stimuli given during the EEG stage of wakefulness (W), 5 were missed because of the subjects' lapses of attention during the fluctuations of awareness that occur on the onset of sleep (Oswald, 1962). This immediately introduces an error in the assessment of sleep duration as an overestimate compared to the EEG. On the other hand, 10 out of a total of 69 stimuli applied during Stage 1 EEG sleep were positively responded to. In a further 5 instances not only was a mechanical response made but there was a transient return of alpha rhythm and return of wakefulness (paradoxical alpha response). Of the 224 stimuli given during sleep recording 25 led to a transient return of wakefulness (Table II). This was mainly due to the subject's ability to make a purposeful mechanical response during Stage I and during REM sleep.

#### DISCUSSION

Davis *et al.* (1938) and Loomis *et al.* (1938) in their early papers on the EEG during sleep described five stages of sleep (A to E). Stages B to E correspond to the four major stages of Rechtschaffen: REM sleep had not been described at that time. It was recognized that external stimuli could provoke the return of the alpha rhythm for short periods down to stages B and C (Davis *et al.*, 1938) and that sleeping subjects were capable of pressing a rubber bulb in response to a pre-arranged stimulus. Roth (1961) made a special study of the EEG in states of lowered vigilance and confirmed that subjects were able to respond to external stimuli down to Stage C of the Loomis scale and that only in Stage D was responsivity to external stimuli completely absent. In common with our observations he found paradoxical reactions and transient reappearance of the alpha rhythm in

TABLE II  
*Responsiveness to light stimulus in sleep stages*

| Sleep stages ..                   | W  |   | 1  |    | 2 |    | 3 |    | 4 |    | REM |   |
|-----------------------------------|----|---|----|----|---|----|---|----|---|----|-----|---|
|                                   | +  | - | +  | -  | + | -  | + | -  | + | -  | +   | - |
| Mechanical responses ..           | 46 | 5 | 10 | 59 | 1 | 51 | 0 | 22 | 0 | 10 | 9   | 4 |
| No. of arousals to wakefulness .. | 0  | 0 | 5  | 3  | 0 | 5  | 0 | 1  | 0 | 0  | 9   | 2 |

response to stimuli down to what he terms 2(c).

It is this capacity of subjects to make purposeful responses in the lighter stages of sleep that largely accounts for the error in the assessment of sleep duration of this recorder: this particularly occurs in Stage 1 and during the REM phase of sleep (Table II). Responsiveness to external stimuli in REM sleep was not expected, since in experimental animals thresholds for arousal in REM sleep are higher than in deep sleep. This however, does not apply to man, in whom responsiveness to external stimuli during REM sleep seems to be similar to that in the lighter stages of sleep (Shagass, 1972).

The EEG definition of the instant of onset of sleep and assessment of duration of the lighter stages is difficult. Monroe (1968) has shown that inter-rater reliability for scoring sleep stages between different observers, whilst good for REM and deeper stages of sleep, is poor for the moment of onset of sleep and Stages 1 and 2. Agnew and Webb (1972), however, in a study of the measurement of sleep onset by EEG criteria, found a high degree of reliability and intercorrelation between observers when one of two different criteria were used to indicate sleep onset:

(1) The complete disappearance of alpha for one minute, or one second of 4-7 c.p.s. in the non-dominant alpha trace; or (2) the first appearance of 14 c.p.s. in the record.

Sleep recorders based upon the subjects' varying responsiveness to external stimuli in wakefulness and sleep will therefore underestimate the total duration of sleep by approximately 10 per cent. They will accurately estimate Stage 2 and deeper levels of sleep, what earlier workers referred to as 'true sleep'

as opposed to 'floating sleep'. The recorder may be of some limited value, therefore, for recording the approximate duration of 'true sleep' for patients in clinical situations.

#### SUMMARY

The duration of sleep as estimated by a sleep recorder (previously described) is compared with estimation of sleep made simultaneously in the same subject with EEG monitoring. The recorder underestimated the total duration of sleep by 10 per cent. This was largely due to retained capacity for making responses in Stage 1, early Stage 2 sleep and R.E.M. sleep.

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## The Relation of Blood Adenosine Triphosphate to Changes of Mood in Affective Disorders

By OTTO HANSEN and MARIA DIMITRAKOUDI

Peripheral whole blood uridine diphosphate glucose (UDPG) has been found to be significantly elevated in psychotic depression (Hansen, 1969; 1972a, b), and this was related to an equally significant lowering of whole blood adenosine triphosphate (ATP). Addition to healthy human blood of UDPG accelerated the hydrolysis of ATP *in vitro* (Hansen, 1972a), and UDPG concentration dependently enhanced the activity of a vegetable ATP diphosphohydrolase (EC 3.6.1.5), which was also inhibited by adenosine 3', 5'-cyclic monophosphate (cyclic AMP) in a concentration-dependent manner (Hansen, 1972b). Other workers have recently published a similar inhibition of a rat heart ATPase by cyclic AMP (Dietze and Hepp, 1972), and another research group have found that sodium-potassium exchange pump changes and changes in erythrocyte membrane ATPase activity correlate significantly with mood alterations in psychotic depressive patients (Dick, Dick, Le Poidevin and Naylor, 1972; Naylor, Dick, Dick, Le Poidevin and Whyte, 1973). This paper reports a study of the relationship between blood ATP levels and mood in patients suffering from manic-depressive predictable (Jenner, 1971) short term cycle psychotic states, and in depressive patients receiving electroconvulsive treatment.

### METHODS

A quantitative thin-layer chromatographic method (Hansen, 1972a, b) with fluorescence measurements *in situ* of the separated nucleotides was used in determination of the ATP values already published. On chemical grounds these findings have been considered as numerically true (Hansen, 1972a, b).

In the present study ATP was determined by the widely used luciferin-luciferase technique, applying Sigma's FLE potassium arsenate buffered firefly

preparation. 0.025 ml. blood was boiled in 0.300 ml. 0.9 per cent NaCl (giving a less turbid supernatant than water (Beutler, Baluda, Sturgeon and Day, 1965; Hansen, 1966; 1969)), centrifuged at 22,600 g<sub>av</sub> for two minutes, and stored at -15° if measurement could not be made within seconds. 0.100 ml. of the supernatant was mixed with 0.050 ml. 10 per cent MgSO<sub>4</sub> (in addition to that already found in the buffered preparation) and 0.900 ml. Sigma FLE-50 firefly preparation in 9.9 ml. water. Light emission at 5,500 Å was automatically recorded from 1 to 3 minutes after mixing.\*

Forrester (1972) reported the peak of the light emitted to be found at 5,620 Å. In both our Swedish and British laboratories with two different FLE-batches, bought more than a year apart and in different hands, we found the peak sharply defined at 5,500 Å, as would be expected with purer reagents (Gilmour, 1961).

The firefly technique remains to some extent a 'biological' method. *In vivo* the enzyme, luciferase, first complexes with ATP, the complex forming a further complex between reduced luciferin and AMP. This again is oxidized by molecular oxygen with emission of light. The oxidized complex is strongly product-inhibited, and *In vivo* luminescence is controlled, it is thought, by pyrophosphate which can free luciferase from the oxidized complex, allowing for interaction with more reduced luciferin and ATP (McElroy, 1951; Carlson, 1969).

Large amounts of Mg are necessitated in the analysis, and it is not compromised by great variations in added Ca; and while it is sensitive to 'unphysiological' amounts of Na (which can however be compensated for within a wide range by addition to the standards) the concentration of the salt used does not result in measurable effects. The very stable pH of the reaction mixture was 6.7 at 20°.

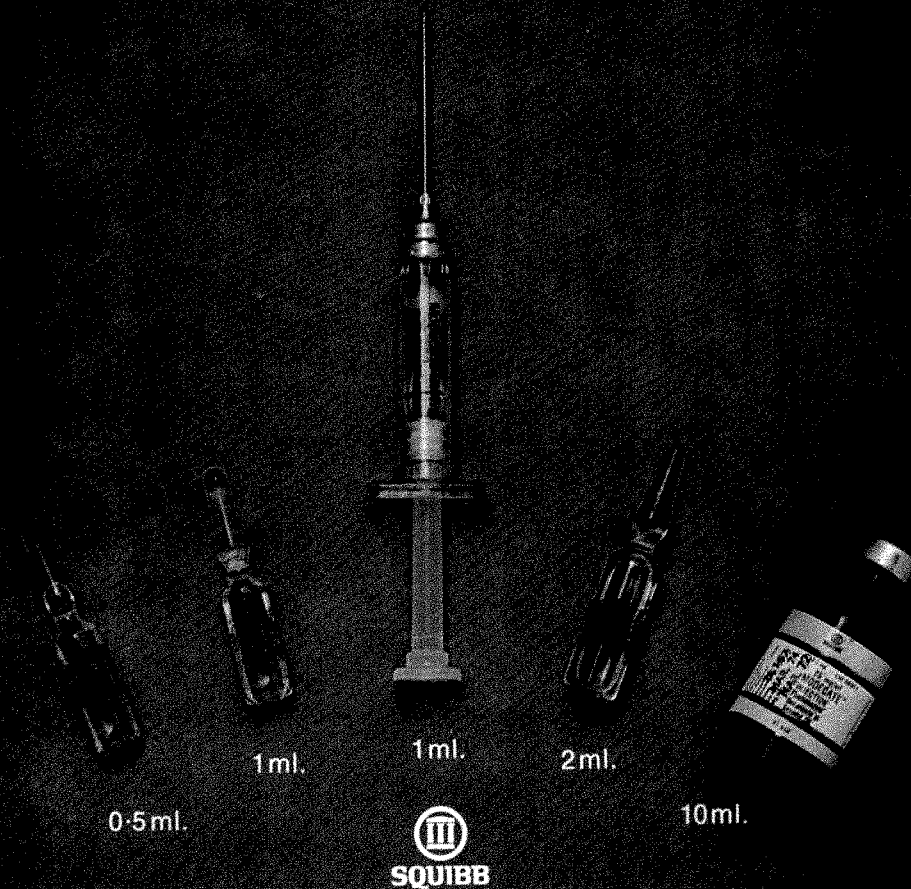
Maximum light emission is seen instantaneously when ATP is added, and can be recorded only by specialized instrumentation, but it is followed by a decay the continuous logarithmic signal of which

\* See later improved modification with measurements after 20 seconds.

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describes a straight line. ATP concentration-light emission (direct) linearity was absolute from 20 seconds after addition of ATP from the nanogram range to many times that corresponding to physiological situations.

Thus, with ATP in water, measurements could be made at any convenient point of time during the light decay, and the values obtained agreed closely with those found by the chromatographic method (Hansen, 1972a, b), as was also the case with the method applied to determinations on some tissues other than blood. However, although traditional recovery experiments, i.e. determining added ATP on the top of that originally found in the blood, yielded virtually 100 per cent, it was noted that with blood the light decay slope was somewhat less steep than with standards in water. The small amount of blood substances other than ATP added (in the reaction mixture corresponding to the content of only  $7.7 \mu\text{l}$ . blood) would not make an interference likely resulting in prolongation of the decay time *per se*. Since furthermore the slope change was linear and not logarithmic, reaction with substances giving rise to emission of light at a slower rate than did ATP, or a continuous production or 'liberation' of ATP appeared more likely. We also got private information from other laboratories about a 'blank' value.

Some commercially available mono and diphosphate nucleotides gave rise to small (as compared with ATP) light signals, but this could not be repeated after thin-layer chromatography purification or with synthetic samples. However, in agreement with Forrester (1972) we found the FLE preparation to convert other triphosphates to ATP. The milieu of the actual blood analysis is probably far from optimal for the enzyme system responsible, and the conversion rate was slow.

With all patient and control blood samples the non-ATP influence three minutes after mixing with the reagents ranged from five to seven mg. per 100 ml. in ATP equivalents, and, with correction for this, fasting early morning fingertip whole blood was with 11 normal subjects (staff members and students) found to be 19 (S.E.M. =  $\pm 0.9$ ) mg. per 100 ml. on one morning and 20 (S.E.M. =  $\pm 1.5$ ) mg. a week later, against 20 (S.E.M. =  $\pm 1.4$ ) mg. per 100 ml. for 17 comparable normal subjects (Hansen, 1972a) with the chromatographic method. These values were again in close agreement with those found by workers using systems of non-gradient (Bishop, Rankine and Talbot, 1959) and gradient (Bartlett, 1968) elution from Dovex 1-formate columns.

The Sigma firefly preparation is extremely convenient, and arrangements have now been made to allow for routine measurements 20 seconds after

mixing of blood and reagents, at which point of time the non-ATP influence would appear to be negligible. Without any correction, 11 fasting morning normal samples (5 ♂, 6 ♀; 28 (S.D. =  $\pm 10$ ) years of age) yielded 23 (S.E.M. =  $\pm 0.9$ ) mg. per 100 ml.

The rapid degradation of ATP in blood at room temperature was arrested by boiling, and no directly applicable chemical deproteinization technique compatible with the method has as yet been found. But after cooling ATPase activity is regained (Swartz, Kaplan and Lamborg, 1958; Hansen, 1972a, b), and for this reason time and temperature precautions, i.e. boiling of the blood immediately after collection, subsequent freezing, and keeping frozen until the very start of analysis must be scrupulously observed to avoid totally misleading results. Forrester (1972) used the firefly technique after chromatographic separation to insure specificity, and we ourselves have successfully combined instantaneous freeze-drying, extraction and thin-layer or column separation with the method, but such procedures are not well suited for clinical routine.

In several instances both fingertip and venous blood was collected, and the indication is that in principle venous blood may as well be used in studies of this type. Reproducibility with the latter was, however, less satisfactory. Evidently samples must be obtained without stasis, and the slightest coagulation in tube or syringe appears to give lower findings. The all-important time factor also becomes more difficult to control.

Mood rating was by experienced nursing staff made every four hours on an unsophisticated seven-point manic-depressive scale (Jenner, Gjessing, Cox, Davies-Jones, Hullin and Hanna, 1967). The rating actually used covers the four hours in which the blood was taken.

## RESULTS

Patient A (Fig. 1) was a 42-year-old woman admitted to a metabolic ward from a mental hospital for short term investigation. This was the first patient studied, and the examination could not be done blindly. Mood ratings were made independently, but the experimenter collected the blood and made the ATP determinations. The 48-hour cycle seen from the figure was striking, the depressive phases being pitifully dark and the manic ones marked by pressure of speech, overactivity, disinhibition, and infectious gaiety. Clinically established affective illness had lasted sixteen years, having been more serious for the last ten. During these

ten years the periodicity has usually been predictable, and there has been a tendency towards shorter cycles, until during the particular period of study a forty-eight-hour one was present. The patient received no medication. Lithium had been tried earlier with no apparent benefit.

Patient B was a 40-year-old female mental hospital in-patient transferred to the metabolic ward for investigation. She suffered from a

manic-depressive illness reported to have made its début more than twenty years previously. From the beginning it presented the characteristic mood cycles seen in Fig. 2. After the period of the figure, collection of blood was continued with 43 samplings over 71 days, giving a total of 65 samples collected over an uninterrupted period of 163 days, with daily mood ratings. The patient, who is diagnosed as of subnormal intelligence, seems to experience unpleasant hallucinations during the manic phases. The blood ATP findings with patient B were obtained blindly, and she received no drugs.

Fig. 3 shows ATP decreases related to two normal menstrual periods. A third healthy woman had generally stable ATP concentrations, and no relationship to menses could be seen.

Fig. 4 demonstrates the blood ATP and mood findings made with patients C and D during courses of electroconvulsive treatment. Both were admitted to the metabolic ward.

Patient C was a 34-year-old man diagnosed as suffering from endogenous depression. He had had recurrent depressive episodes during the last nine years. He has had two episodes of hypomania following previous electroconvulsive treatment. The patient was admitted very depressed and agitated. Clinically he responded well to a course of six shocks. All medication was exchanged for amitriptyline during treatment. The ATP study was blind.

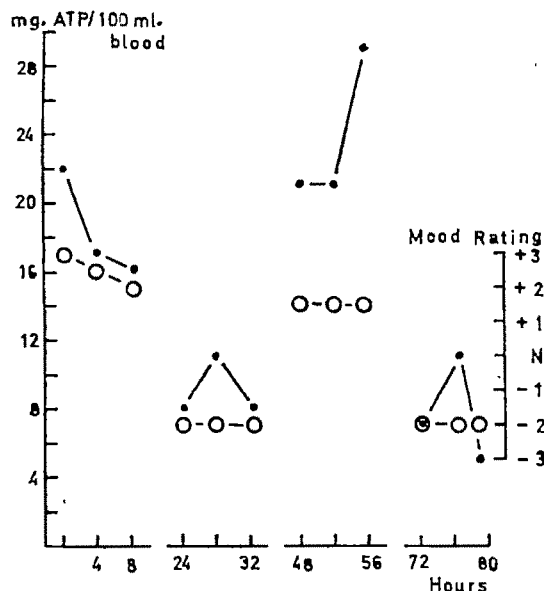


FIG. 1.—Fasting early morning fingertip whole blood ATP (●) of patient A (means of double values) against mood (○).

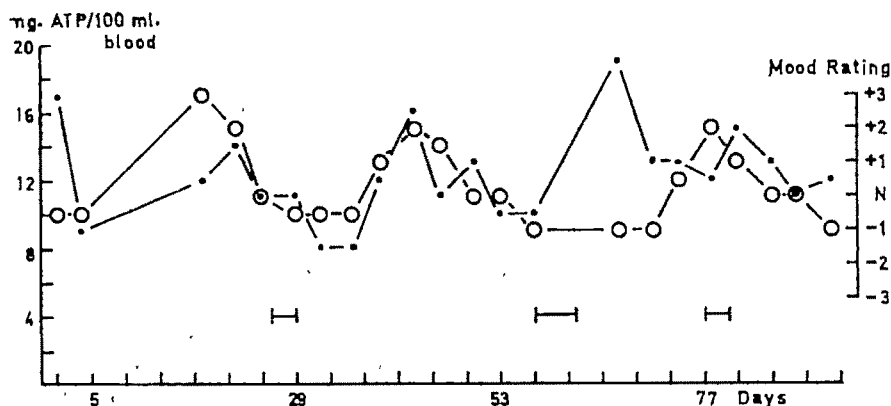


FIG. 2.—Fasting early morning fingertip whole blood ATP (●) of patient B (means of double values) against mood (○). Menstrual periods inserted (/—/).

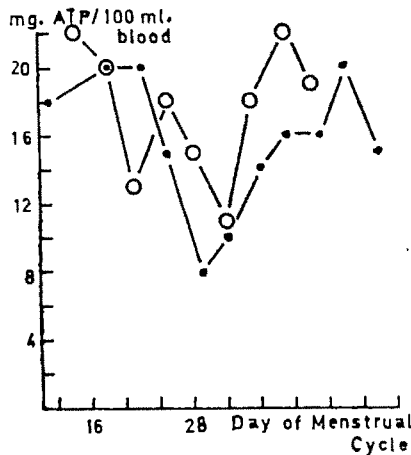


FIG. 3.—Fasting early morning fingertip whole blood ATP of two normal subjects (means of double values), No. 4 (●) and No. 7 (○) of Table I, through menstrual cycle.

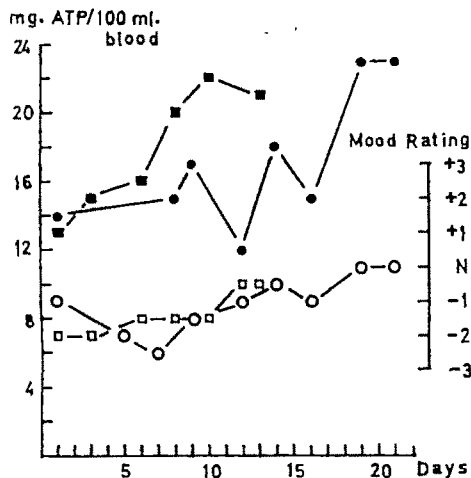


FIG. 4.—Fasting early morning fingertip whole blood ATP of patients C (●) and D (■) (means of double values) against mood (○, □) during course of electroconvulsive treatments. In the case of patient D, ECT was administered after blood sampling on all six recorded days, in the case of patient C on the last six recorded days.

Patient D was a 62-year-old female patient admitted to the metabolic ward very depressed and agitated. The diagnosis was endogenous depression. The patient has had three depressive episodes during the last three years. Two of them were treated with electroconvulsion, and both times the patient responded with hypomania. She received six shocks and again became hypomanic. Other medication was exchanged for amitriptyline. The ATP study was blind.

Fig. 4 shows the early morning fasting blood ATP. ECT was administered two to three hours later. ATP was then measured 30 minutes after treatment, but the changes were only in the order of from 1 to 3 mg. per 100 ml. although in most instances they increased after electroconvulsion. In one instance with patient C, ATP did rise 8 mg. and in one with patient D 6 mg. It may be worth mentioning that with patient C there was no change after the last two shocks, and with patient D there were rises of 2 and 1 mg.

Nine of the controls were repeatedly studied, almost always at weekly intervals. A total of 101 samples (days) gave a mean value of 18 (S.E.M. =  $\pm 1.3$ ) mg. ATP per 100 ml. blood. The individual subjects' mean values are stated in Table I.

#### DISCUSSION

The blood ATP values of patients A and B (Figs. 1 and 2) are in the depressive and manic phases squarely within the range in the group studies (Hansen, 1972a) found with diagnosed psychotic depressives, and with normal controls, respectively. The ATP/mood correlation-coefficient for patient A is 0.85, with a significance of  $p < 0.001$ . With patient B all 65 sampling days gave a correlation-coefficient of 0.33, with  $p < 0.01$ . Earlier results with groups of patients (Hansen, 1972a, b), as well as the present findings, do not indicate that mania is associated

TABLE I  
mg. ( $\pm$ S.E.M.) ATP per 100 ml. fasting morning fingertip whole blood in normal controls.  
N = sampling days

| Subject no. . . | 1             | 2             | 3             | 4             | 5             | 6             | 7             | 8             | 9             |                       |
|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------------|
| Sex . .         | ♂             | ♂             | ♂             | ♀             | ♂             | ♀             | ♀             | ♂             | ♂             |                       |
| Age (years) . . | 49            | 40            | 38            | 34            | 33            | 28            | 23            | 23            | 18            | 32 (S.D. = $\pm 10$ ) |
| ATP . .         | 17            | 16            | 16            | 17            | 16            | 19            | 19            | 21            | 22            |                       |
|                 | ( $\pm 0.8$ ) | ( $\pm 0.8$ ) | ( $\pm 1.3$ ) | ( $\pm 1.4$ ) | ( $\pm 1.0$ ) | ( $\pm 1.0$ ) | ( $\pm 1.1$ ) | ( $\pm 1.1$ ) | ( $\pm 1.1$ ) |                       |
|                 | N=11          | N=11          | N=11          | N=14          | N=9           | N=10          | N=13          | N=11          | N=11          |                       |



with an increase in blood ATP. On the other hand, the hypothesis that in psychotic depression there is a lack of available ATP (Hansen, 1972a, b) is further supported.

The normal averages agree with the findings in the group studies, but the longitudinal examinations of normal controls (Table I) indicate individual differences in variability. In two of the female subjects (Nos. 4 and 7) normal menstrual periods appeared to have a relationship to blood ATP changes (Fig. 3), but a third female (No. 6 of Table I) had generally stable ATP concentrations, the lowest value ever seen being 15 mg. per 100 ml., with no indication of any relationship to menses. While the psychotic periodicity of patient B (Fig. 2) did indicate a 28-day element, it is difficult to see any connexion with the somewhat irregular menstrual periods.

It is seen from the magnitude of the ATP changes, both in the normal women and in the patients, that they are unlikely to be a function of haematocrit changes. No direct connection was previously found between nucleotide levels and depressed patients' haemoglobin values. In the earlier experiments, it will also be recalled, blood UDPG concentrations were high in the patients showing low ATP values. Nevertheless the relationship between ATP and haemoglobin was calculated for patient B during the cycles reported in Fig. 2, no change resulting from expressing ATP per g. of haemoglobin instead of as a concentration.

In the case of patients C and D (Fig. 4) treated with electroconvulsion, what could clinically be hoped for and what was also essentially obtained was normalization. The joint-ATP/mood correlation-coefficient was 0.60 with  $p < 0.02$ . With calculation for patient C alone the correlation-coefficient was 0.74, with  $p$  still  $< 0.02$ . With calculation for patient D alone it was 0.70, but with the smaller number of observations the significance goes down to the 5 per cent level.

There may be some indication that ATP concentration increase preceded clinical improvement, but although the clinicians considered this very unlikely, improvement could be due to the change of medication, or to the admission to the metabolic ward, or even

fortuitous. It would seem important to try to control the difficult problematic involvement of a possible psychological effect of preparation for treatment, anaesthesia, pharmacological muscle relaxation, or oxygen administration. ATP must certainly be involved in many of the physiological effects of electroconvulsion, and although experiments are scattered and difficult to evaluate, both steroids and the sodium-potassium exchange pump have been implicated.

Forrester's (1972) studies of ATP release into the plasma from muscles during work would appear to exclude the possibility that changes in motor activity of the patients in a depressive or manic phase could influence blood values to an extent significant for the present work. Further, exercise experiments in our laboratory initiated with normal subjects would indicate that highly significant changes in whole blood ATP cannot be caused by ordinary motor activity. But again there is the question whether this could be different for different persons, or for persons in a different situation, certainly including convulsion?

During work on the improved form of the luciferin-luciferase technique, blood has been collected from male and female staff after ordinary meals and during the day, the average ATP values remaining unchanged as compared with fasting results. Prolonged sleep deprivation in normal persons, however, led to a manifold increase in blood ATP (Wilkinson, 1965), and, interestingly, the psychotic episodes were preceded by a decrease to normal or near normal. This has been interpreted as indicative of the existence of an emergency mechanism to meet stress on the energy-transfer system by an increased production of ATP.

The late P. C. T. Jones demonstrated a marked increase in liver and brain ATP levels in sleeping as opposed to waking hamsters (1970), and, pointing to the possible role of ATP in mediating cellular behaviour, he suggested that many cellular phenomena which are reflected in the behaviour of the whole organism depend on and respond to ATP fluctuations (1972).

Our present and previous findings (Hansen, 1969; 1972a, b), the strict intracellular sodium and potassium/ATP correlation (Ling, 1962),

red cell membrane ATPase activity: correlation with mood in affective disorders (Dick, Dick, Le Poidevin and Naylor, 1972; Naylor, Dick, Dick, Le Poidevin and Whyte, 1973), circadian fluctuations of ATP level (Jones, 1970; 1972), and the effect of sleep deprivation (Wilkinson, 1965) may all be interpreted to fit the hypothesis that ATP is both the key energy-rich compound for cellular functions and a mediator of intercellular and/or intracellular signals coupled with the energy transfer.

We feel the indication could well be important that blood ATP is ordinarily very stable in normal persons, and yet just not so in some, or sometimes, perhaps, not so in all. Accordingly closer studies of normal subjects are in progress.

# SUMMARY

In the light of previous findings in group studies of decreased blood ATP concentrations in psychotic depression (Hansen, 1972a, b), two manic-depressive women with predictable periodicity of illness were studied longitudinally with ATP determinations and mood rating. Again, ATP was found to be low in the depressive phases, and it correlated significantly with mood.

A male and a female 'endogenous depressive' patient were followed with blood ATP determinations and mood rating during a course of electroconvulsive treatment. Correlating significantly with mood scores, ATP rose to normal with clinical recovery.

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(Received 3 September 1973)

## Urinary Excretion of Adenosine 3':5'-Cyclic Monophosphate in Depressive Illness

By G. J. NAYLOR, D. A. STANSFIELD, S. F. WHYTE and F. HUTCHINSON

Changes in the excretion of adenosine 3':5'-cyclic monophosphate (cyclic AMP) have been reported in depressive illness. Abdulla and Hamadah (1970) reported that urinary cyclic AMP excretion was lower than normal during depression and increased with recovery. However, these results were based on single 24-hour urine collections during depression and on recovery, with no creatinine estimations to suggest that the collections were complete. There was no control of diet, drugs or activity. The controls do not appear to have been matched for age. Paul, Ditzion, Pauk and Janowsky (1970) reported that the cyclic AMP excretion in neurotic depression was higher and in psychotic depression was lower than in a control group, but neither difference was statistically significant. However, on enlarging the study by including more psychotic depressives they reported that the cyclic AMP excretion of this group was significantly less than that of the controls (Paul, Cramer and Goodwin, 1971). These workers had controlled the patients' drug and dietary (but not fluid) intake. There appeared to be only minimal control of activity. The results were based on approximately two samples of urine per subject, which were very carefully checked for completeness of collection. Unfortunately the age of the controls (19-22 years) was very different from that of the patients (25-64 years). On two small groups of patients treated with either Laevodopa or lithium carbonate, they reported that changes in affective state were accompanied by changes in the urinary excretion of cyclic AMP. However, in serial studies on manic-depressive patients Paul, Cramer and Bunney (1971) failed to show a correlation between mood rating and cyclic AMP excretion in five out of seven patients; but they reported that the cyclic

AMP excretion was increased on the day of rapid switch from depression to mania. The above groups of workers had used an enzymatic-isotope displacement technique to estimate the cyclic AMP. Brown, Salway, Albano, Hullin and Ekins (1972), using a saturation method to assay cyclic AMP, found no correlation between mood and cyclic AMP excretion in two short-cycle manic-depressive patients. Jenner, Sampson, Thompson, Somerville, Beard and Smith (1972) wrote: 'We have measured daily excretion by a number of depressed and manic depressive patients over periods covering several mood changes without being able to establish any consistent correlation between cyclic AMP excretion and mood, . . . However, in one unusual case we have found a very marked correlation'. We (Naylor, Dick, Dick, Moody and Stansfield, 1974) were unable to demonstrate any relationship between urinary cyclic AMP excretion and mood in a patient with recurrent psychotic episodes, in which depressive features predominated.

In view of conflicting reports it was decided to investigate whether the urinary excretion of cyclic AMP by patients maintained under carefully controlled conditions increased with their recovery from a depressive psychosis (not short-cycle illness).

### METHOD

Fourteen physically healthy female patients suffering from a depressive psychosis (I.C.D. 296.2) were investigated. Shortly after admission to hospital each patient was interviewed independently by two of us (G. J. Naylor and S. F. Whyte). Each interviewer made a clinical diagnosis (according to the International Classification of Diseases) and rated the patient on the Kendell (Kendell, 1968) and on the Newcastle

(Carney, Roth and Garside, 1965) diagnostic scales. In all cases the clinical diagnoses agreed, and the average of the two Kendell ratings was above 10 and of the two Newcastle ratings above 3.

Within their first week of admission to hospital the patients were transferred to the Metabolic Unit where they remained for seven days. The patients were then returned to the admission ward for treatment; except for two who recovered spontaneously, this was with ECT or tricyclic antidepressants (Table II). All patients were sufficiently depressed to require in-patient treatment and their condition varied in severity from moderate depression to semi-stupor. When the patient was considered by the psychiatrist in clinical charge to be well enough to be discharged from hospital, she was returned to the Metabolic Unit for a further seven days. Here the patients ate a diet of their own choice but the daily intake of calories (1,760 calories) and water (1,900 ml.) was the same for each patient and was maintained constant throughout both periods in the Unit. Patients were not allowed coffee, and each patient drank the same amount of weak tea during both spells in the Unit. All patients in the Unit were given a regular dose of butobarbitone (100 or 200 mg.) as nocturnal hypnotic, and some received a regular dose of amylobarbitone sodium (60 mg. three times daily) as daytime sedative; no other drugs were given. The patients spent mornings in bed, and though they were ambulant during the rest of the day their activity was restricted to the Unit. Each patient's mood was rated twice daily by skilled nursing staff on a simple four-point scale. Twenty-four hour samples of urine were collected daily in polythene bottles, with one gramme of sodium metabisulphite as preservative (Paul *et al.*, 1970). During the collecting period the samples were refrigerated (4 °C); on completion of each collection the volume was measured and 100 ml. stored in labelled bottles at -15 °C until required for analysis. The urine from the first 24 hours in the Metabolic Unit was discarded. The regime, including diet, activity and drug intake, was the same during both periods in the Unit.

Urinary cyclic AMP concentrations were estimated by a saturation method (Brown,

Albano, Ekins, Sgherzi and Tampion, 1971) using materials supplied by The Radiochemical Centre, Amersham (Bucks). Urinary creatinine concentrations were estimated by the method described by Varley (1969). Urinary cyclic AMP excretion has been expressed as micro moles cyclic AMP per gramme of creatinine.

## RESULTS

Of the 14 patients investigated the results of two have been discarded, one patient proving uncooperative in urine collections, the other patient being rated more depressed during the second period of investigation than during the first. In the 12 remaining cases, urine collections were complete, and all 12 patients were rated free from depression during the second period of investigation. The mean age of these patients was  $58.8 \pm 4.4$  years. The mean interval between the two assessments was  $9 \pm 2$  weeks.

The significance of each of the biochemical changes with recovery has been estimated by two tail 't' tests for correlated means. The amounts of cyclic AMP excreted per gramme of creatinine are shown in the Table I. With recovery from depression the mean excretion of cyclic AMP per gramme of creatinine increased significantly ( $P < 0.02$ ). This increase was not accompanied by any statistically significant change in urine volume. Changes in urinary cyclic AMP and changes in urine volume did not correlate significantly ( $N = 12, r = +0.31$ ). The mean 24-hour excretion of creatinine did not change with recovery, which confirms our belief that urine collections were complete or at least as complete during the depressed as during the recovered periods. The patient's weight did not change significantly with recovery; thus creatinine excretions can be assumed to have remained stable, since it is believed that they are constantly related to tissue mass.

Of the 12 patients who recovered, 11 showed an increase in urinary cyclic AMP excretion. The percentage increase with recovery shows a wide scatter (Table II), but the changes do not correlate with initial severity of depression, type of antidepressant treatment given or time interval between estimations. Though the mean

TABLE I  
Urine values and body weight in twelve patients during depression and on recovery

|                                                        | Depressed |      | Recovered |      | Difference |      | P*    |
|--------------------------------------------------------|-----------|------|-----------|------|------------|------|-------|
|                                                        | Mean      | SE   | Mean      | SE   | Mean       | SE   |       |
| Cyclic AMP-micromoles per gramme of creatinine .. .. . | 4.50      | 0.44 | 6.03      | 0.59 | +1.53      | 0.56 | <0.02 |
| Urine volume-ml. per gramme of creatinine .. .. .      | 1,782     | 192  | 2,000     | 220  | +218       | 123  | NS    |
| 24-hour creatinine excretion—grammes                   | 0.68      | 0.04 | 0.72      | 0.05 | +0.04      | 0.05 | NS    |
| Body weight-kg. .. .                                   | 63.0      | 3.4  | 63.5      | 3.7  | +0.5       | 2.8  | NS    |

\* By two-tail 't' test for correlated means.

TABLE II  
Cyclic AMP excretion ( $\mu$ /moles per gramme of creatine) in the twelve patients who recovered

| No.        | Antidepressant treatment |            | Depressed           |      | Recovered           |      | % increase |
|------------|--------------------------|------------|---------------------|------|---------------------|------|------------|
|            | ECT                      | Tricyclics | Mean of six samples | SE   | Mean of six samples | SE   |            |
| 1 .. .. .  | +                        | +          | 2.27                | 0.42 | 4.78                | 0.59 | 110        |
| 2 .. .. .  | —                        | +          | 2.92                | 0.47 | 3.30                | 0.41 | 13         |
| 3 .. .. .  | —                        | +          | 4.54                | 0.57 | 3.64                | 0.41 | —20        |
| 4 .. .. .  | —                        | +          | 5.64                | 1.18 | 6.43                | 1.02 | 14         |
| 5 .. .. .  | +                        | +          | 4.69                | 0.52 | 5.83                | 0.51 | 24         |
| 6 .. .. .  | —                        | —          | 4.31                | 0.53 | 4.56                | 0.97 | 6          |
| 7 .. .. .  | —                        | —          | 1.79                | 0.24 | 7.36                | 1.21 | 311        |
| 8 .. .. .  | —                        | +          | 4.29                | 0.38 | 5.45                | 0.50 | 27         |
| 9 .. .. .  | +                        | —          | 5.98                | 0.42 | 6.90                | 0.84 | 15         |
| 10 .. .. . | —                        | +          | 4.93                | 1.04 | 5.72                | 1.52 | 16         |
| 11 .. .. . | —                        | +          | 5.74                | 1.02 | 10.82               | 0.87 | 88         |
| 12 .. .. . | +                        | +          | 6.90                | 1.65 | 7.53                | 0.51 | 9          |

increase is heavily affected by only three patients (1, 7, 11), the statistical significance of the increase remains almost unchanged ( $P < 0.025$ ) if these three are omitted. The one patient (No. 3) who did not show such an increase had an atypical depression with marked paranoid ideas, and a case could be made for a diagnosis of paranoid psychosis. Another patient (No. 7) of particular interest was one who clinically showed a dramatic spontaneous recovery from semi-stupor to near normality overnight on the fifth night of her first assessment period. The urinary excretion of cyclic AMP on the two days before the change was low (day 4, 1.20 and day 5, 1.03 micromoles cyclic AMP per gramme of creatinine), but it was seen to have increased on the

two days following the change (day 6, 2.31 and day 7, 2.02 micromoles cyclic AMP per gramme of creatinine). During the second week in the Metabolic Unit (10 to 16 days after the sudden recovery) the values had risen still further (mean over 6 days, 7.36 micromoles cyclic AMP per gramme of creatinine) although her affective state remained normal. Only two of the patients (Nos. 9 and 11) had a previous history of mania: both showed an increase in urinary cyclic AMP excretion with recovery, and both had rather high values in depressed and recovered phases compared with the other patients. In the one patient who was more depressed at the second assessment, the urinary excretion of cyclic AMP showed a corresponding fall.

## DISCUSSION

Our results suggest that when patients recover from a depressive psychosis the urinary excretion of cyclic AMP increases. Although this finding is in agreement with the early reports of Abdulla and Hamadah (1970) and Paul *et al.* (1971b), the size of the change is much smaller than that reported by Abdulla and Hamadah (1970). We have not included a control group because our aim was simply to ascertain whether cyclic AMP excretion and mood in depressive psychosis are in some way related. This method is less likely to lead to false positive results than studies using controls who are not maintained under the same conditions of diet, activity, etc. as the patients and who are often not well matched for age. Though not all the authors describe their patients in detail, the negative results reported by Paul *et al.* (1971a), Brown *et al.* (1972), Jenner *et al.* (1972), and Naylor *et al.* (1974) appear to have come mostly from studies on short-cycle manic-depressives, a group which has yielded conflicting findings in most areas of biochemical interest. It may well be that heterogeneity in the patients diagnosed as manic-depressive has confused the picture. In the present study the relatively high levels of cyclic AMP excreted in the two patients with a history of mania is of interest, but no conclusion can be drawn from such a small group. Similarly no firm conclusion can be drawn from the one patient who showed a rapid spontaneous switch to normality but who did not show the pattern reported by Paul *et al.* (1971a).

Although in attacks of depressive psychosis, but not necessarily in short-cycle patients, it appears that urinary cyclic AMP excretion changes as the mood changes, the reason for this is not known. It has been suggested that increased activity increases the cyclic AMP excretion (Eccleston, Loose, Pullar and Sugden, 1970), but others have denied this (Paul *et al.*, 1971b). Since it is impossible to ensure that patients' activity is the same during depressed and recovered assessment periods, it remains a distinct possibility that changes in activity may be the explanation of the changes in cyclic AMP excretion. It is known that cyclic AMP is cleared from plasma by glomerular filtration (Broadus, Kaminsky, Hardman, Sutherland

and Liddle, 1970) but that the kidney adds a variable quantity of endogenous cyclic AMP, amounting to an average of about one third of the total cyclic AMP excreted. Several hormones, e.g. parathyroid hormone and glucagon are known to affect urinary cyclic AMP excretion; and, as Jenner *et al.* (1972), comment, it seems likely that any changes in urinary cyclic AMP occurring in depressive psychosis are secondary to hormone changes.

The suggestion that changes in urinary cyclic AMP reflect changes in brain cyclic AMP metabolism is unproven. Robison, Coppen, Whybrow and Frange (1970) found no difference between the CSF levels of cyclic AMP of neurological and depressed patients. In contrast Cramer, Goodwin, Post and Bunney (1972) reported that the cyclic AMP concentration of CSF was higher in depressed patients than in a control group of neurological patients. They suggest that such levels do not necessarily reflect the rate of formation of cyclic AMP but represent a balance between its production and its removal.

Speculation about the role of cyclic AMP in depressive illness is tempting, but with so many conflicting reports it is important to establish first what changes in cyclic AMP metabolism do occur.

## SUMMARY

The urinary excretion of cyclic AMP was estimated in 12 patients suffering from a depressive psychosis and estimated again when they had recovered. During each period of assessment the patients were maintained under metabolic ward conditions.

The urinary excretion of cyclic AMP increased significantly with recovery. The urine volume showed no significant change with recovery and did not correlate significantly with the cyclic AMP excretion.

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## Serum Creatine Kinase in Acute Psychosis

By T. HARDING

### INTRODUCTION

The enzyme creatine kinase (CK) is present in high concentration in skeletal and cardiac muscle and brain tissue (Dawson and Fine, 1967). Raised serum levels of the enzyme occur in skeletal muscle disease, following myocardial infarction and in hypothyroidism. Raised levels have also been demonstrated in acute cerebral disease (Acheson *et al.*, 1965), but earlier suggestions that this might be due to leakage of enzyme from brain tissue have not been confirmed by isoenzyme separation studies (Dubo *et al.*, 1967), which have shown that the excess enzyme came from striated muscle. Raised serum CK levels associated with acute psychosis have also been reported (Bengzon *et al.*, 1966; Meltzer *et al.*, 1969; Coffey *et al.*, 1970; and Gosling *et al.*, 1972). This has led to the suggestion that serum CK estimation could be used in the differential diagnosis of psychiatric patients (Meltzer *et al.*, 1970; Gosling *et al.*, 1972). Meltzer (1969) has also claimed that the biochemical abnormality reflects 'a basic patho-physiological process common to the acute psychoses'.

This study was designed to investigate further serum CK levels in psychiatric patients and to assess the practical use and theoretical implications of the biochemical findings.

### METHOD

Serum CK estimations were carried out, using the technique described by Rosalki (1967) with a minor modification described by Smith (1967), in three groups of patients:

1. *Acutely psychotic group.* Blood samples were obtained from all acutely psychotic patients admitted to the Royal Edinburgh Hospital during a six month period within 24 hours of admission. In those patients with initial serum CK levels greater than 100 I.U./L. serial estimations were carried out at intervals of

2 days until 8 days after the level fell below 100 I.U./L. and thereafter at weekly intervals for three weeks. Patients were accepted as acutely psychotic according to the following criteria:

- (a) newly admitted to a psychiatric hospital;
- (b) exhibiting two or more of the following conditions: (i) autochthonous hallucinations; (ii) definitely bizarre behaviour; (iii) delusional mood or perception or paranoid delusions; (iv) formal thought disorder; (v) incongruity of affect or morbid mood change;
- (c) in addition, a diagnosis of schizophrenia, manic-depressive psychosis or paranoid psychosis to be confirmed by a trained psychiatrist;
- (d) the onset of the illness (defined by the above conditions) to have been less than one month prior to admission. In the case of patients with previous episodes of psychotic illness, they should have had a period of at least six months since last ill.

Patients were assessed clinically by psychiatrists who were not aware of the results of the serum CK estimations. Data were recorded daily for each patient concerning their clinical state and treatment.

2. *Chronic schizophrenic group.* Single blood samples were obtained from 20 patients, all of whom:

- (a) had a firm diagnosis of schizophrenia;
- (b) had been in hospital for more than a year;
- (c) exhibited one or more of the following as current symptoms: (i) formal thought disorder; (ii) passivity feelings; (iii) hallucinations; (iv) delusional thinking.

3. *Non-psychotic, newly admitted psychiatric patients.* Single blood samples were obtained from 26 consecutive non-psychotic patients newly admitted to an admission unit in the Royal Edinburgh Hospital.

Patients were excluded from the study if they suffered from chronic alcoholism, hypothyroidism, myocardial infarction within the previous month, muscle disease or trauma within the previous two weeks, or if they had received any intramuscular injection during the previous three weeks.

### RESULTS

There were 34 patients (15 men, 19 women) in the acutely psychotic group. Only 2 patients were excluded on the grounds that they had received intramuscular injections before their admission. The diagnoses were: schizophrenia, 23; paranoid psychosis, 4; manic-depressive psychosis, 7 (3 were manic or hypomanic and 4 depressed). The distribution of their initial serum CK values is shown in Fig. 1. They ranged from 10–710 I.U./L. (mean 74 I.U./L.). Five patients had initial values in excess of 100 I.U./L., and serial estimations were therefore performed. Some details of these 5 patients are shown in Table I and the results of serial estimations and data concerning 3 of these patients are shown in Figs. 2–4. Serum CK levels fell to below 100 I.U./L., without subsequently rising, within 2–18 days of admission. All 5 patients displayed either marked increase or marked decrease in motor activity and serum CK levels fell as this became normal. In 4 of the 5 patients other psychotic symptoms such as delusions and hallucinations persisted after serum CK levels fell below 100 I.U./L.

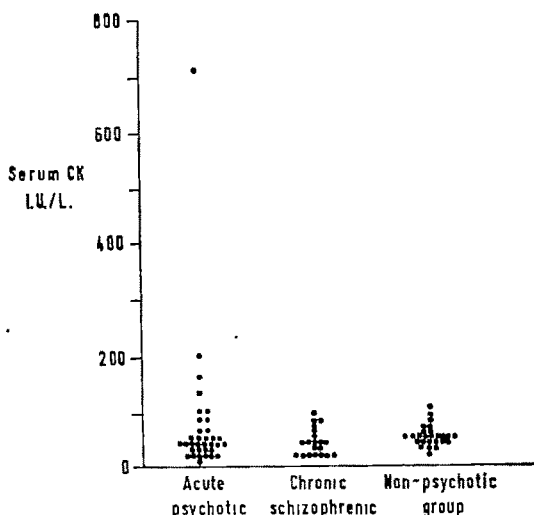


FIG. 1.—Serum CK levels in three patient groups.

In the 20 chronic schizophrenic patients (10 men, 10 women) serum CK levels ranged from 16 to 87 I.U./L. In the 26 newly-admitted non-psychotic patients (10 men, 14 women) serum CK levels ranged from 20–101 I.U./L.

The results of the three patient groups are shown in Fig. 1. Each group shows a positively skewed distribution with modal values in the range 25–50 I.U./L. Comparison of the groups by logarithmic transformation and analysis of variance revealed no significant difference in their distributions (F ratio 0.76; d.f. 2; 78).

### DISCUSSION

The results of this study are compared with some previous studies in Table II. Notwithstanding differences in study design, there are striking discrepancies between these results; for example the reported percentages of psychotic patients with serum CK levels in excess of 200 I.U./L. appear to be evenly distributed in the range 0–84 per cent. Smith *et al.* (1970) studied serum CK levels in a group of 300 healthy, ambulant males and found a positively skewed distribution, with a modal value in the range of 20–30 I.U./L. There were 25 individuals with levels greater than 300 I.U./L. 'Normal' and 'raised' levels can therefore only be defined in terms of an arbitrary percentile

TABLE I  
*Acutely psychotic patients with initial serum CK levels > 100 I.U./L.*

| Diagnosis                              | Initial serum CK level in I.U./L. | Number of days until serum CK became < 100 I.U./L. |
|----------------------------------------|-----------------------------------|----------------------------------------------------|
| 1. Acute schizophrenic psychosis .. .. | 160                               | 4                                                  |
| 2. Paranoid schizophrenia .. ..        | 202                               | 18                                                 |
| 3. Mania .. ..                         | 104                               | 10                                                 |
| 4. Paranoid schizophrenia .. ..        | 710                               | 12                                                 |
| 5. Acute schizophrenic psychosis .. .. | 139                               | 2                                                  |

## SERUM CREATINE KINASE IN ACUTE PSYCHOSIS

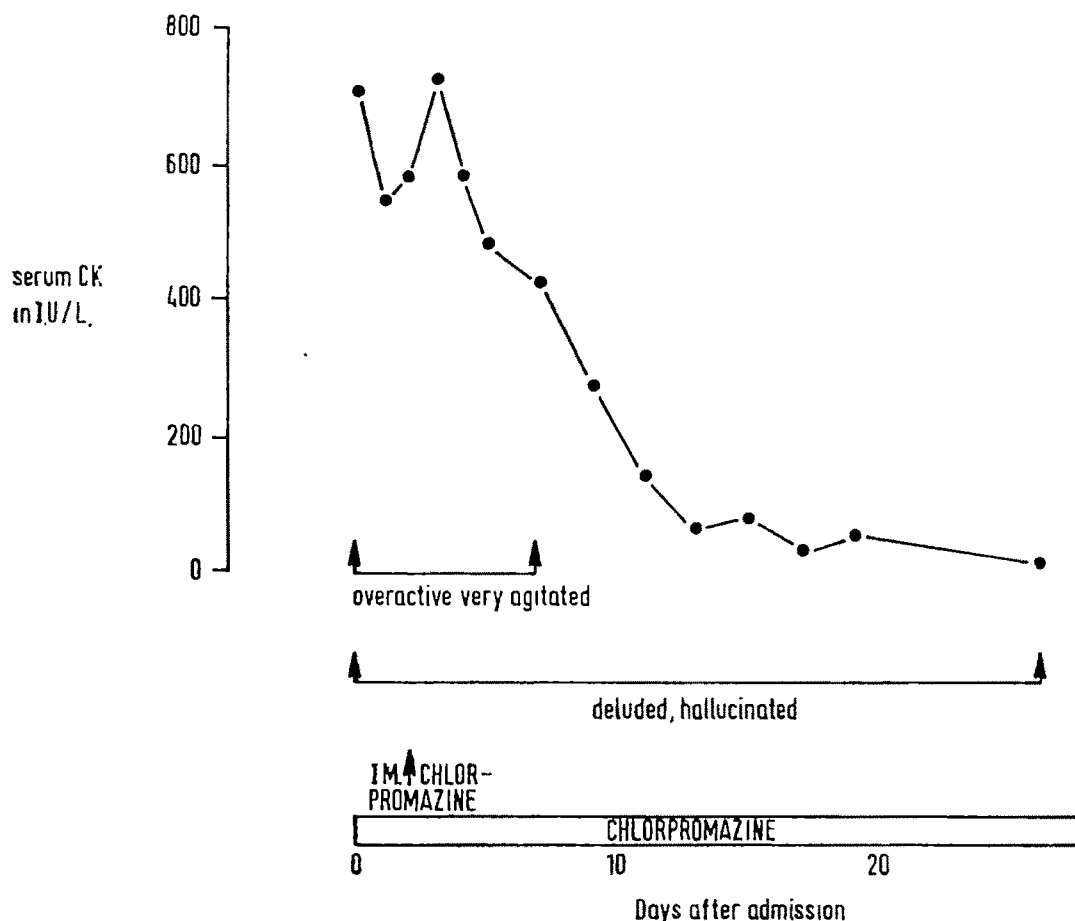


FIG. 2.—Serial serum CK estimations: patient with paranoid schizophrenia: Male, aged 24 years.

value based on such a healthy population, and in this study a threshold level of 100 I.U./L. (representing approximately the 90th percentile) was used to define patients with 'raised' levels.

The results of this study suggest that such raised serum CK levels are associated with abnormal motor activity rather than with the psychotic illness itself, since levels fell to normal as motor activity became normal while psychotic symptoms persisted. This would be consistent with the findings of Gosling *et al.* (1972) who showed that high serum CK levels in 20 acutely psychotic patients were associated with 'disorganized hyperactivity' more than with other psychotic symptoms as measured by the In-Patient Multidimensional Scale. Nevertheless Gosling *et al.* (1972) and Meltzer (1969) have preferred the interpretation that raised levels

reflect the psychotic illness itself. In doing so I believe that they have underestimated the range and distribution of serum CK levels in normal subjects and also the potential effect of abnormal motor activity on serum CK levels. Gosling *et al.* (1972) state that physical activity does not raise serum CK to the levels seen in acutely psychotic patients, but Griffiths (1966) showed that a group of 30 medical students who walked from London to Brighton (87 km.) all had levels in excess of 100 I.U./L. and 28 per cent had levels in excess of 2,000 I.U./L. Serum CK levels are therefore potentially unstable, and they may rise in other situations, e.g. sleep deprivation (Kupfer *et al.*, 1970). Acutely psychotic patients display a variety of abnormal behaviours including motor abnormalities and changes in sleep and eating. I

believe that the raised serum CK levels which are observed in some acutely psychotic patients are related to such non-specific factors rather than to the primary illness process.

What of the possible use of serum CK estimation as an aid to diagnosis in psychiatric patients, as advocated by Meltzer *et al.* (1970) and Gosling *et al.* (1972)? Such a diagnostic test must have acceptable sensitivity (a measure of how many 'cases' are correctly identified) and specificity (a measure of how few 'normals' are wrongly identified as 'cases'). The specificity and sensitivity at three possible threshold levels based on data for acutely psychotic and newly-

admitted non-psychotic patients, in the study are shown in Table III. Although high levels of specificity are achieved at threshold levels of 80 I.U./L. and 100 I.U./L., the sensitivity is strikingly low. In a population such as the one studied such a test would not be useful. Even if satisfactory sensitivity and specificity had been achieved it would still be necessary to demonstrate that the test provides useful information not otherwise available before its use could be advocated. In this study all psychotic patients with raised serum CK levels could be readily diagnosed clinically, and a diagnostic test would have been of no additional value.

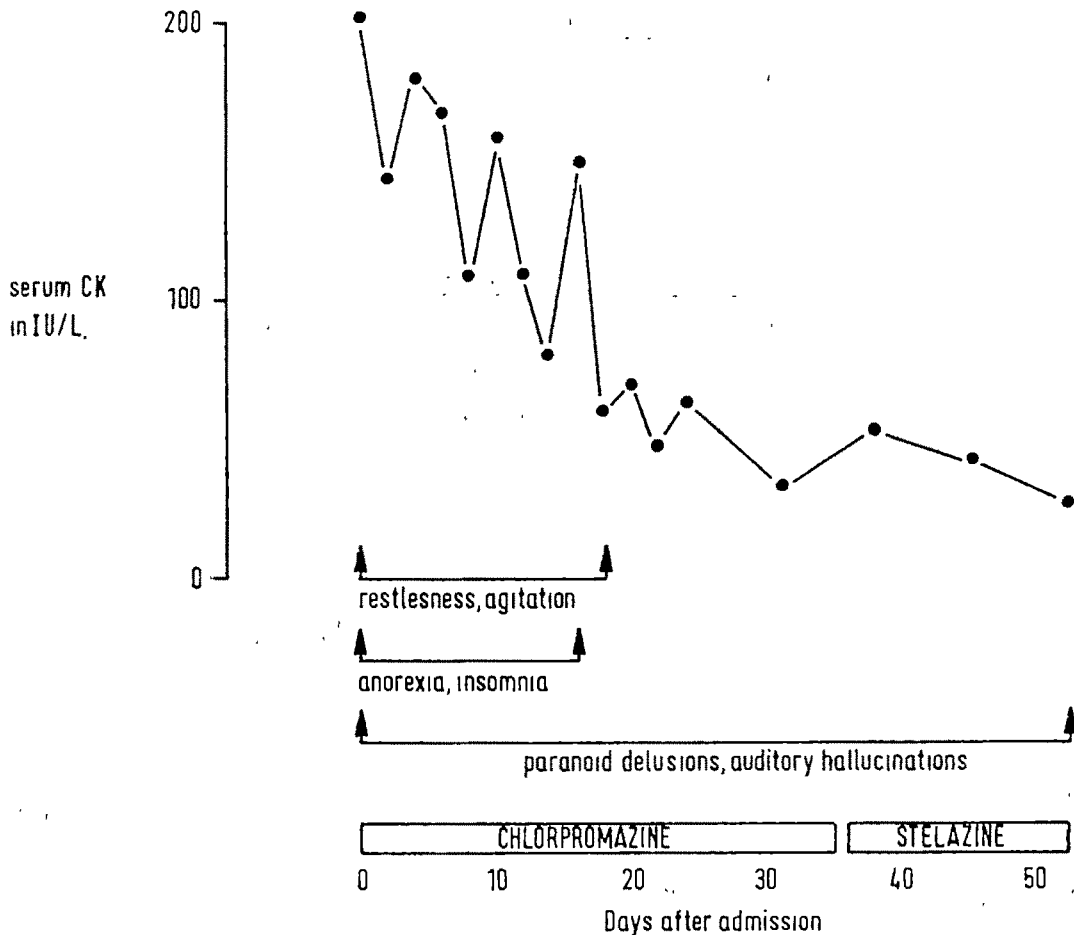


FIG. 3.—Serial serum CK estimations: patient with paranoid schizophrenia: female, aged 42.

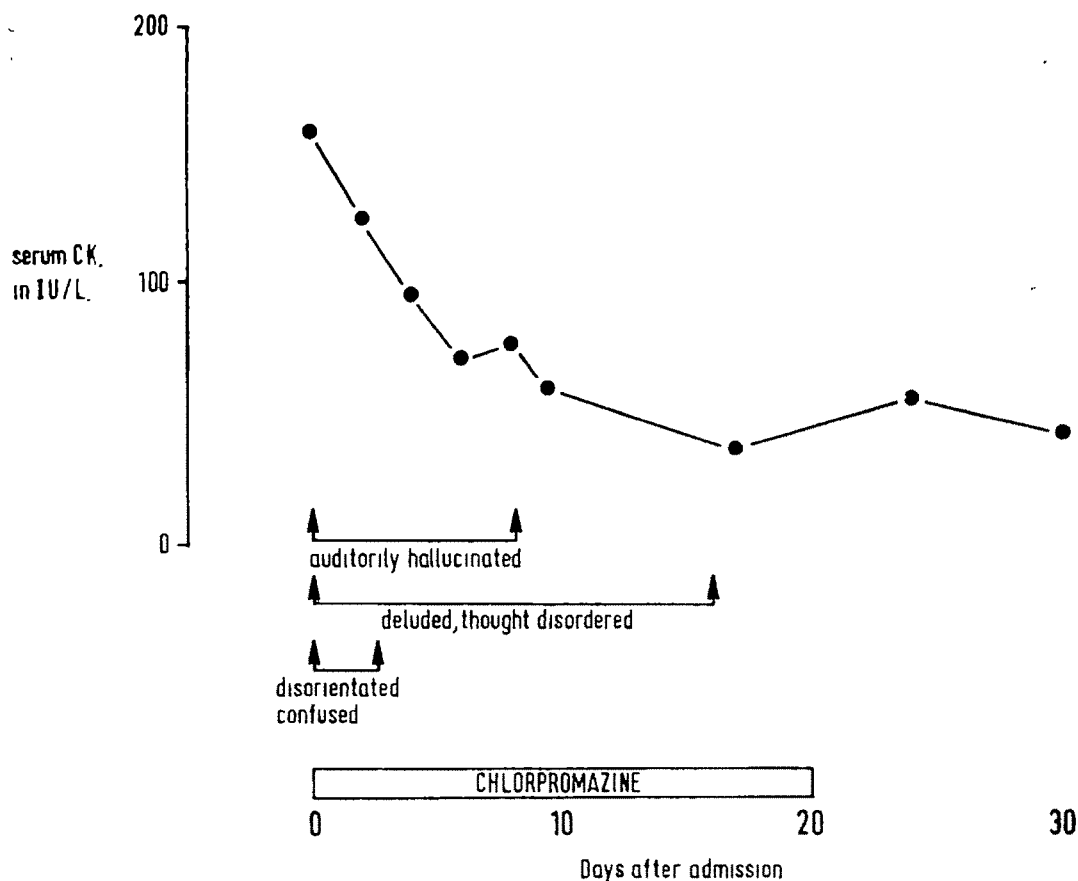


FIG. 4.—Serial serum CK estimations: patient with acute schizophrenic episode (oneiroid state): female, aged 23.

TABLE II

*Comparison of the results of several studies on serum CK levels in psychosis*

| Study                        | Patients             |    | Number of patients | Percentage of patients with serum CK level (in I.U./L.) in excess of: |     |     |     |
|------------------------------|----------------------|----|--------------------|-----------------------------------------------------------------------|-----|-----|-----|
|                              |                      |    |                    | 50                                                                    | 100 | 200 | 500 |
| Schiavone and Kaldor (1965)  | Schizophrenics ..    | .. | 24                 | 33%                                                                   | *   | 16% | *   |
| Bengzon <i>et al.</i> (1966) | Acute psychotics     | .. | 60                 | 35%                                                                   | *   | 15% | *   |
| Meltzer (1969)               | Acute psychotics     | .. | 18                 | 89%                                                                   | 89% | 84% | 50% |
| Meltzer <i>et al.</i> (1969) | Acute psychotics     | .. | 37                 | 67%                                                                   | 65% | 44% | 19% |
| Meltzer <i>et al.</i> (1970) | Acute schizophrenics | .. | 25                 | 84%                                                                   | 64% | 16% | 8%  |
| Coffey <i>et al.</i> (1970)  | Acute schizophrenics | .. | 32                 | 56%                                                                   | 33% | *   | 9%  |
| Goaling <i>et al.</i> (1972) | Acute psychotics     | .. | 20                 | 65%                                                                   | 50% | 40% | 20% |
| Loebel and Robins (1973)     | Acute psychotics     | .. | 8                  | 12%                                                                   | 0%  | 0%  | 0%  |
| Present study                | Acute psychotics     | .. | 34                 | 38%                                                                   | 14% | 6%  | 3%  |

TABLE III  
Specificity and sensitivity of serum CK estimation in the diagnosis of acute psychosis at three threshold levels

| Threshold level<br>in I.U./L. | Sensitivity<br>% | Specificity<br>% |
|-------------------------------|------------------|------------------|
| 50                            | 43               | 38               |
| 80                            | 27               | 92               |
| 100                           | 17               | 96               |

## SUMMARY

Serum CK levels were determined in 34 acutely psychotic, 26 newly-admitted non-psychotic and 20 chronic schizophrenic patients. In each group a positively skewed distribution of CK levels was found, with no overall significant difference. Five acutely psychotic patients had levels greater than 100 I.U./L. It is argued that these 'raised' levels are related to non-specific factors and do not reflect the psychotic illness directly, as has been suggested by others. Experience in this study does not support the view that serum CK estimation is of diagnostic value in psychiatric patients.

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(Received 27 November 1973)

## Fact and Fiction in the Care of the Mentally Handicapped

By ALEXANDER SHAPIRO

It is over a year since the conference on 'The Responsibilities and Role of the Doctor in the Care of the Mentally Handicapped' was held, at which Sir George Godber delivered the opening address published in the *Journal* for December 1973 (pp. 617-20).

The opinions Sir George expressed deserve the closest attention and consideration: not only are they the views of an eminent and respected colleague, but they are views which have moulded the thinking of his Department in the planning of services for the mentally handicapped. The Mental Deficiency Section of the Royal College of Psychiatrists has now stated in a Memorandum published in *News and Notes* for May 1974 its own version of what the doctor's role should be; but a detailed commentary on the Address itself also seems necessary and justified.

For a long time now there has existed a 'black legend' concerning the services for the handicapped and those who serve in them. The legend is based on half-truths and ignorance of fact, especially of historical fact. It is all pervasive, and unfortunately it has influenced even Sir George's views.

Although Sir George is ambivalent towards those of us who specialize in mental handicap, and although in the course of his address he did say a few kind and appreciative words about us, the general picture that emerges is hardly a flattering one.

He sees us as institutionalized providers of custodial care, ignoring the wide world outside the institution walls, training the 'inmates' to accept institutional life rather than helping them to lead 'lives as normal as they could', and ignoring 'the growing new educational and social techniques'.

General day-to-day activities are, in Sir George's opinion, primarily concerned with control of infection and G.P. duties. Obviously

one cannot expect much skill or capacity for original thought from such workers, and therefore 'major advances in understanding many aspects of mental handicap have, with only a few exceptions, come from outside the medical specialty of mental handicap'.

No wonder, therefore, that the attitude first of the Ministry of Health and now of the Department of Health and Social Security has been patronizing, not to say contemptuous. This is exemplified by the slighting remarks made in a number of circulars, and by the fact that the Adviser in Mental Handicap to the Department has, since Dr. D. H. H. Thomas's death, been not a consultant psychiatrist but a psychologist, and that consultants in the specialty have not been nominated to participate in WHO meetings concerned with the medical aspect of the specialty. Some of our non-medical colleagues, notably nurses and social workers, have also suffered from this negative attitude.

Reality is perhaps somewhat different. To begin with, it must be remembered that until the late 1920s or early 1930s the majority of the mentally handicapped were in fact living in the community. There existed a handful of voluntary institutions such as the Royal Earlswood and the Royal Eastern Counties, and a very few provided by public authorities, such as Darenth and Calderstones, but the services envisaged in the Mental Deficiency Act of 1913 could not begin to be provided until the aftermath of World War I had passed. Some local authorities, indeed, had no institution of their own even at the time the National Health Service came into being in 1948. Thus most mentally handicapped people were living with their families or else in small groups in the care of untrained private individuals, and so they should have been 'enjoying' the benefits of 'normalization'. But the benefits were far from

apparent. Professor Penrose, whom Sir George mentioned in his Address, frequently commented that when he came into the field in the late 'twenties there were many more complaints and scandals about ill-treatment and neglect in the community than there have been in recent years in regard to hospital care; in fact it was partly to ensure that such abuses did not occur that the policy was adopted of caring for defectives in public institutions staffed by responsible medical officers and managed by committees of public-spirited citizens.

Care and protection, however, constituted only one aspect of the institution's functions. Primarily the concept was a therapeutic one. Douglas Turner, of the Royal Eastern Counties Institution, in his Presidential Address to the Royal Medico-Psychological Association in 1933 expressed this aim as follows: 'We believe . . . that the great majority of defectives are very much improved by the training and stabilization they receive in institutions, so that many of them can be sent back into the world to earn their livings or with some supervision to be cared for more simply and less expensively'. He also made the point that this view meant a return to Seguin's ideas current in the 1830s.

Because of the massive unemployment prevalent at that time, the absence of provision for what we now call 'social security', and also because of certain restrictive sections of the Mental Deficiency Acts, the large-scale discharge of patients, especially those of medium grade, was neither practicable nor desirable. Nevertheless, in spite of the economic difficulties, high-grade patients had available to them considerable training programmes undertaken by a large number of craftsmen instructors with a view to making them viable in the community. Thus the aim of returning the patient to community life, after training and improvement, was accepted and current among specialists in mental deficiency in the 1930s, and did not originate outside the service in the 1950s as Sir George seems to believe.

Sociological studies of psychiatric hospitals, such as those associated with the names of Stanton and Schwarz, Goffman and Russell Barton have undoubtedly had beneficial results. However, the sociologists fell into the trap of

over-inclusive thinking and over-generalization which has led to their inability to discriminate between social systems and the pathology to which they may be liable; in other words to an incapacity to judge whether failures or abuses are inherent in the system or are incidental results of extraneous factors.

Those who offer 'normalization' in the community as a complete alternative to hospital care are naive in their belief that the patient's basic disabilities and handicaps are iatrogenic, and in ignoring the probability that the disabilities ascribed to institutionalization were in fact the reason for the original admission to hospital. Almost more serious is their apparent inability to understand that community care and hospital care are complementary, and that patients should be free to move from one type of care to the other as clinical and social considerations dictate.

It is not questioned that abuses have occurred (and I hope to return to this later on), and without doubt rigid attitudes fostered by Local Authority bureaucracy and rigid staff hierarchies did exist in the past. To the enlightened leaders in the field, however, the 'Colony' concept was one of provision of a supportive environment that would enable the handicapped to lead a much fuller and more satisfying life than they would otherwise attain. These ideas ensured consistent and kindly care; and in some ways the quality of social life of patients, with the provision of the whole gamut of occupational and recreational activities, was of a higher quality in the days of so-called 'custodial care' than we have given our hospital patients under the influence of our 'modern' and 'scientific' theories, or than they can have living in the community, in small numbers under 'normalized' conditions.

Equally erroneous is the current belief repeated by Sir George that it was the post-war work of psychologists that 'demonstrated the gain to be had from the training of the severely subnormal'. It is true that the contribution of clinical psychologists to the development of methods of assessment and care have been of great importance; but I am certain that the workers named would be the last to claim that there was no training of the low-grade patients



before them. A considerable amount of training and occupational therapy was a matter of course in all the institutions and hospitals from the middle of last century onwards, when training was the avowed aim of the institution. I personally remember when I first came into the specialty in 1939 at the Middlesex Colony, how impressed I was by the brush shop, where imbeciles—some too low grade to be able to give their full name—were producing all the brushes from brooms to toothbrushes used in the Colony and which were also supplied to some of the neighbouring mental hospitals. These low-grade patients developed skills and attained proficiencies which were at least as high as those of patients specially trained under industrial therapy experimental workshops.

What research psychologists have demonstrated is that the training given to medium and high-grade defectives may not have been generally well-adapted to the practices of modern industry, and that under conditions of full employment many defectives could, after training, take part in normal industrial activities, either in workshops within the institution or in the community. Even here they had been anticipated; for instance during the Second World War some medical superintendents such as Dr. Rohan of Colleshill had patients working in essential industries, travelling to and from the hospital during the blackout and earning wages at industrial rates.

I would like now to examine the contention that the medical specialists in mental handicap have not contributed much to the advances of understanding of the specialty. Turner, to whom I have already referred, was a good example of the illustrious workers in our specialty who contradict the assertion. Not only did he think clearly and plan wisely the social developments of patient care, and express ideas that sound fresh and progressive to our modern ears, but he appreciated the need for systematic research in the field. It was his vision which brought Penrose to his hospital to carry out the now classical Colchester Survey. Considering the small number of specialists in the field, one is struck by the volume and the quality of the work done by them in the first half of the

century. Taking names at random: there was Berry pioneering neuropathological studies at the turn of the century, Norman, who continued his work at Stoke Park and also carried out genetical surveys on the distribution of intelligence. (Our predecessors were impressively wide-ranging in their interests.) There was Stewart of Leavesden, a neurologist and neuropathologist of distinction (he had been President of the Neurology Section of the Royal Society of Medicine), who, in addition to work he did himself, attracted research workers of the calibre of Ross Ashby, who worked at studies in neuropathology before turning his attention to cybernetics. C. J. C. Earl, a psychiatrist, in the 'twenties tackled with characteristic brio the problem of psychiatric illness in idiocy, well before Kanner had formulated his concepts of autism. Earl, like so many psychiatrists of his generation, was an able clinical psychologist, and incidentally it was he who introduced the Rorschach test into this country. A. F. Tredgold, whose book was the most authoritative text in mental handicap for well over a third of this century, gave a tremendous impetus to clinical studies in the field.

E. O. Lewis, carried out single-handed the classical national survey for the Wood report. It is impossible to give a complete account, but no one could discuss scientific and clinical work in mental handicap without mentioning Penrose and his contribution. It is ironical that Sir George should quote Penrose, who more than any other single man has shaped and moulded the thinking, research and practice of mental deficiency, as an example of a worker outside the field. That was not how Penrose saw himself. He had begun his professional career in psychiatry and mental handicap, and the latter remained an abiding interest for the rest of his life, notwithstanding his achievements in a number of other sciences. The present generation of consultants and research workers in the field have all been subjected to his influence, and most consider themselves as his pupils.

Penrose himself was very critical of the present trends, and had a great belief in the usefulness of hospitals and the importance of the medical contribution to the understanding and the therapy of mental handicap. It is significant

that after retiring from the chair of Human Genetics at University College he chose to continue his researches at the Kennedy-Galton Centre at Harperbury Hospital among the patients for whom he had much liking and respect, besides the scientific interest he took in them. Penrose always considered that meaningful formulation of research enquiries could be best made by clinicians in daily contact with patients. This aspect is becoming of practical importance, for the development of pre-natal diagnosis and prevention requires skilled expertise in the clinical manifestations of mental handicap.

It would be invidious to mention by name workers of the present generation, but everyone should be aware of the steady stream of published research and clinical work from hospitals such as the Fountain (now at Queen Mary's Hospital), Stoke Park, St. Lawrence's, Harperbury and Lea Castle, to mention but a few.

In a way our nursing colleagues have suffered even more than the doctors. Sir George in his address said that it was in the past that 'other staff in the local authority 'colonies' were looked on as attendants rather than nurses'. On the contrary, this is true of to-day's attitudes, which prevail particularly amongst the advocates of 'normalization'.

In actual fact the terms 'attendants' and 'nurses' had been used either interchangeably or for male and female staff respectively since before 1800; and from 1891 the Royal Medico-Psychological Association had seen to the training and examination of mental nurses, and this included the staffs, both male and female, of institutions for the mentally defective. In some ways the training and qualifications allowed greater scope than is the case at present, and postgraduate qualifications were available in occupational therapy and teaching—anticipating an arrangement recently revived experimentally by the Chiswick College. From 1921, nurses from these institutions had their own separate syllabus and were awarded their own certificate. Adequate training of psychiatric nurses was in those days considered a very important and major function of the Royal Medico-Psychological Association.

It is regrettable that present denigration of the role of the nurse and the effects of present planning policies are so destructive of morale, as are also the Briggs recommendations that there should be a separate caring profession, divorced from nursing. The belief that specially trained personnel on the Scandinavian pattern are more adapted to give the necessary care to the handicapped is based on a misunderstanding. The Scandinavians have no specially trained psychiatric nurses, and have therefore had to train special care staff. The syllabus approximates closely that of our nurses—except that they are much less able to give the physical nursing care that so many mentally handicapped need. The nursing situation here is aggravated by plans for the replacement of large hospitals by small units with the consequent erosion of career structure which will force the ablest nurses out of their chosen specialty. We must be made aware that we are witnessing attempts at the wanton dismantling of a profession fundamental to the adequate provision of civilized care for the handicapped.

Having examined the past and present status of mental handicap services, Sir George puts forward two propositions. The first is that the role that medicine has to play in the service is becoming progressively restricted—and that it should no longer be 'a comprehensive role of controlling and being responsible for all aspects of their patients' lives'. He does, however, add 'provided always there is someone else who will do it at least as well'.

The other proposition is that whatever the residual part that medicine has to play 'it is difficult to identify a specific and differentiated role for the psychiatrist working as a specialist in mental handicap'.

Let us examine these propositions. The first has gained currency at the Department of Health and Social Security, and Dr. Elizabeth Shore, participating in the symposium on psychiatric training at the Autumn 1973 Quarterly Meeting of the College, said that it has yet to be shown that the care of the mentally handicapped is a medical concern. Medicine is becoming more and more complicated, and the body of knowledge to be assimilated and retained by the medical student is beginning to

verge on the unmanageable. The tendency now is for specialization to be enforced earlier and earlier in one's medical career, and there may be a time in the future when medicine will have to split into separate professions that share common biological training and approach—an extension in fact of the situation that exists at present between medical men and dentists. When that time comes, though I cannot see it happening for twenty years or more, it is possible that the future practitioner in psychiatry (mental illness as well as mental handicap) will have his roots as much in clinical psychology as in organic medicine. Until such time comes, however, there is need for the doctor to be responsible for the total management of a patient in relation to his environment.

Because the aetiology of mental handicap is largely one of pathology, whether genetical, traumatic or infective, and because of the important incidence of emotional and psychiatric disturbances in affected individuals it is inconceivable, as Sir George does concede, that there should be no involvement of medicine in mental handicap. It is difficult to see how one can ask doctors to accept responsibility and yet deny them the opportunity of managing their cases.

The argument that the management of total life patterns of patients is not medicine is not tenable. The adjustment of the total individual to his emotional and social environment may not be organic medicine, but it is a very good definition of social psychiatry. It is of course true that mental handicap manifests itself in the whole range of human activities and relationships and that no single discipline is capable of dealing with all its manifestations. The caring team must include educationists, psychologists, social workers and sociologists as well as doctors and nurses; yet it is essential that all these disciplines should be coordinated into an integrated and cooperative team.

It seems to me that at present there is no one who can assume the role of coordinator as well as the psychiatrist. As a medical man he has been trained in the biological sciences that underlie organic medicine. As a psychiatrist he must (and will under the influence of the College) be well trained in the behavioural

sciences. No member of other discipline or profession that is involved in the care of the handicapped has the necessary training to be able to assume the total control of the patient.

Countries like Israel, where the care of the handicapped is considered to be purely a matter of social welfare services, have considerable problems and difficulties in dealing with hyperkinetic, disturbed, asocial and delinquent individuals, and they are at present studying methods of involving psychiatrists more closely in the provision of care. Both in Israel and in Scandinavia the disciplines concerned with the provision of care do little or no research, which is left largely in medical hands. It is only in some cases, especially in education, that the handicapped may need the help of a particular non-medical discipline in which case that discipline assumes responsibility.

The second proposition, that the care of the mentally handicapped is a 'generalism' rather than a 'specialism' is based, I think on a misunderstanding of what a specialty is. The frame of reference of a specialty may be either the disturbances of an organ or the disturbance of some biological process, as in the metabolic diseases, but it can also be an area of medicine where the problems presented by the patient are closely inter-related, as in the case of psychiatry. In some cases the limits of the specialty are set by the patients' age, as in paediatrics, geriatrics and even child psychiatry. In many ways the claims of paediatrics to be a specialism rather than a generalism is much weaker than that of psychiatry of mental handicap, for paediatricians deal with all the disturbances that can occur in human beings up to the age of twelve or sixteen years; yet no one appears to dispute the paediatrician's claim to be a specialist. Accepting the responsibility for a group of patients presenting associated problems, as in the case of mental handicap, is in my opinion very much the function of a specialist.

We should, however, examine whether mental handicap specialism is necessary or whether other specialties can fill the vacuum created by its disappearance. To start with, it is an undisputed fact that if a subject is central to the interests of a specialist it is likely to receive much

more attention and care than if it is a matter of fringe interest. If an area of pathology is productive of chronic illness it will tend to be neglected unless it becomes the centre point of involvement of a clinician or a research worker. No better example can be adduced to this than geriatrics. Before Marjorie Warren created the specialty of geriatrics most old people were looked upon as chronic medical cases and banished to the limbo of chronic annexes. The same is true of mental handicap. The taking over of mental handicap by paediatricians, for example, to be relegated to off-the-site chronic annexes of the general hospital will, I am convinced, lead to neglect and low standards of care. An important fact also is that only a minority of paediatricians claim an interest in mental handicap and they are too few to accept the responsibility for providing a full service.

There is, however, a much more cogent argument against handing over the care of the mentally handicapped to the paediatrician and the child psychiatrist, and that is that the very time when these specialists consider the patient no longer a child and are prepared to transfer him to the care of their adult counterparts is the most sensitive and most vulnerable time in the life of the handicapped. The transition from childhood to adult status is a very long and gradual one, demanding a continuity of care and making a chronological boundary to clinical activity totally inappropriate. It is equally true that adult psychiatrists are capable of looking after the mentally handicapped, but all the clinical developments for the last century have been in the direction of specialization of the care of the mentally handicapped, and this trend has been a rewarding one in terms of the quality and volume of work. This is not to say that the specialists in mental handicap need solely to be psychiatrists, but rather that the special problems of the mentally handicapped require specialization. At present paediatricians, geneticists, biochemists and neuropathologists are making important contributions to the quality of clinical services in our hospitals for the mentally handicapped, but they are specialists in the subject—and so bring an important contribution to the total psychiatric management of patients.

Sir George is critical of the standards of care in the specialty. I have tried to show that standards are not as bad as Sir George fears, nor is the quality of personnel as poor as he imagines. The British services, under the direction of specialist psychiatrists, have earned themselves an enviable reputation throughout the world, and no other country, except the United States, has achieved as much in the development of both clinical care and research. There have, however, been very severe shortcomings, and we need go no further than recall the painful occurrences at Ely and Farleigh. It is plain that the reasons for these were very poor establishments of staff, lack of adequate facilities, and above all the constant disparagement to which the workers in the services have been subjected; the low level of out-patient activity to which Sir George alluded demonstrates, not that there is lack of interest in community care, but that it is impossible to provide an adequate service with present establishments. The paucity of training posts, particularly for senior registrars, even at those hospitals which have full facilities for training in all aspects of clinical work and research, makes the training of future consultants very difficult. The position of research is equally discouraging. In the United States in recent years a large number of research and training institutes have been built up, most of them lavishly equipped and with very adequate clinical and scientific research workers; in this country it is a herculean task to get funds for the most essential research.

Although it is generally recognized that a comprehensive, integrated service is essential to the provision of care under optimal conditions, central administrative action has in recent years been fragmenting the service by splitting off areas of care to educational and social service authorities. The clinician is faced with the daunting problem of providing adequate care across administrative boundaries. The potential entrant into the specialty is warned off by denials of its very existence. It is no wonder that we are having difficulties with recruitment into what in official eyes is a non-existent or a dying specialty. We are confronted with a crisis in morale, and the

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The recent report in the Sunday Times on the treatment of Broadmoor patients with hormone drugs to suppress sexual desire describes how a male patient had to have a breast amputated. The article stated that this followed treatment by Androcur (Cyproterone Acetate), but the following points have since been made clear:

1. The drug used was not Androcur.
2. No patient has required mastectomy because of treatment with Androcur.
3. Androcur is only available in tablet form and cannot be administered by implantation as reported in the article.

The Sunday Times apologizes to Schering Chemicals Ltd for this inaccuracy.

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## Mental Illness in Married Pairs in a Total Population

By OLLE HAGNELL and NORMAN KREITMAN,  
with an Appendix by J. DUFFY

Several surveys of mental illness in husband-wife pairs have all concluded that sick couples occur in the general population with a frequency significantly in excess of the number to be expected by chance (Penrose, 1944; Gregory, 1959; Kreitman, 1962; Ryle and Hamilton, 1962; Pond *et al.*, 1963; Nielsen, 1964). The statistical methods employed in such investigations have been criticized by Hall *et al.* (1971), but these authors' arguments appear to suggest that the relative excess of conjoint illness has, if anything, been under-estimated.

The question of interest is how this concordance is to be explained. Theories which consider that it is the interaction between the spouses that is of major importance have been obliged to pay considerable attention to longitudinal processes, such as the effects of the increasing exposure of an initially healthy partner to his or her chronically sick spouse with increasing duration of marriage. In several studies this kind of process has to be reconstructed from cross-sectional data—scarcely an ideal procedure. A second limitation on previously published work in this field has been that the definition of a 'case' has usually been that of an individual who has presented for psychiatric help. While it is true that similar findings have been derived from in-patient, out-patient and general practice populations, nevertheless it is not possible to exclude with any certainty the effects of selection. These might be particularly complex, since self-declaration by the patient could theoretically be influenced by morbidity in the spouse.

It is hoped that the study now reported is substantially free from both these defects. Hagnell (1966) conducted a total population survey in a semi-rural area in southern Sweden, termed 'Lundby', in 1957, which included all the surviving members from an earlier survey

carried out in the same area by Essen-Möller (1956) ten years before. In addition Hagnell interviewed those of Essen-Möller's sample who had moved and lived elsewhere in 1957. Thus longitudinal data became available, spanning a longer period than is usual in hospital-based studies and covering all the individuals in the population, both healthy and those who were judged by a psychiatrist to be psychologically disturbed. The criteria for morbidity have been spelled out in detail in the two publications cited, but in addition the present study has also included psychopaths and alcoholics as 'cases'; these, like the other probands, were identified by means of a clinical interview plus additional information from key informants, hospital records etc. (Hagnell, 1966). Psychopaths were defined as persons who had marked difficulties in adaptation to the demands of society, profiting neither from experience nor from punishment and who showed a lack of consistent long-term planning, often with callousness and emotional immaturity; at interview they had few complaints or none, and had no history of mental disturbance except those demonstrated by their asocial conduct, often reported by persons other than the individual himself. Alcoholics were a composite group, including alcohol addicts, chronic alcoholics and alcohol abusers, as specified at some length by Hagnell (1972).

### *The 1947 and 1957 Prevalence Surveys*

In the first study by Essen-Möller in 1947, 99 per cent of a defined population of 2,550 persons were individually interviewed, attention being paid both to the occurrence of any psychological symptoms and to personality traits as judged clinically. The re-examination of the same population by Hagnell ten years later successfully covered 99 per cent of those

TABLE I  
*The population of Lundby, 1 July 1947 by age, sex and marital status (N = 2,550)*

| Age, 1947 | Men (1,312) |         |          |         | Women (1,238) |         |          |       |
|-----------|-------------|---------|----------|---------|---------------|---------|----------|-------|
|           | Unmarried   | Married | Divorced | Widower | Unmarried     | Married | Divorced | Widow |
| 0-9       | 197         | 0       | 0        | 0       | 208           | 0       | 0        | 0     |
| 10-19     | 213         | 0       | 0        | 0       | 180           | 2       | 0        | 0     |
| 20-29     | 130         | 50      | 0        | 0       | 47            | 81      | 0        | 0     |
| 30-39     | 61          | 131     | 0        | 0       | 26            | 150     | 0        | 2     |
| 40-49     | 31          | 162     | 4        | 3       | 30            | 142     | 3        | 4     |
| 50-59     | 17          | 95      | 3        | 1       | 26            | 97      | 2        | 9     |
| 60-69     | 18          | 84      | 0        | 10      | 30            | 66      | 2        | 21    |
| 70-79     | 9           | 50      | 2        | 21      | 17            | 34      | 0        | 24    |
| 80+       | 0           | 12      | 0        | 8       | 7             | 8       | 0        | 20    |
| Total ..  | 676         | 584     | 9        | 43      | 571           | 580     | 7        | 80    |

originally seen by Essen-Möller and who were still alive, irrespective of domicile, together with new immigrants to the area and those born since the first survey, a total of approximately 3,300 persons. In the second survey all the interviews were conducted by one psychiatrist, a procedure that has both advantages and disadvantages, but one which certainly helps to maximize uniformity of judgement. There was no intention at the time of the survey that the data should be used for the kind of analysis now presented.

Full descriptions of the population are given in the publications cited, but some illustrative data are shown in the first five tables. Table I indicates the age and marital characteristics of the Lundby population in 1947, while Table II shows the

losses by death between then and 1957: there were virtually no losses to the study by out-migration as subjects who moved were traced and interviewed, as already mentioned. Table III gives the age and marital status of all Lundby residents in 1957. Data for duration of marriage for the married population in 1947 are presented in Table IV, while Table V displays similar data for 1957 but covering only the survivors of the original population (irrespective of location).

Social class allocation follows the official Swedish tripartite classification, which is based on occupation, Class 1 being the highest. Women were categorized according to their husbands' occupation, except for rare instances where they were self-supporting.

## RESULTS

The first step was to ascertain whether the population displayed the concentration of sick husband-wife pairs reported in various other studies. Table VI confirms that this was indeed the case. Of 328 married couples seen in the 1957 survey in which neither partner was aged 60 or over, 50 were pairs in which both partners had had some form of mental illness during the marriage. This is approximately 40 per cent more than the number to be expected on a chance basis and represents a statistically significant excess.

Various sub-groups among the 328 couples were also considered. Age did not influence the pattern of concordance, but social class did;

TABLE II  
*Losses by death in the 1947 population of Lundby during the years 1 July 1947 to 1 July 1957 (N = 253)*

| Age, 1947 | Men |     | Women |     |
|-----------|-----|-----|-------|-----|
| 0-9       | ..  | 1   | ..    | 0   |
| 10-19     | ..  | 2   | ..    | 0   |
| 20-29     | ..  | 7   | ..    | 0   |
| 30-39     | ..  | 4   | ..    | 1   |
| 40-49     | ..  | 10  | ..    | 5   |
| 50-59     | ..  | 14  | ..    | 10  |
| 60-69     | ..  | 33  | ..    | 32  |
| 70-79     | ..  | 41  | ..    | 48  |
| 80+       | ..  | 16  | ..    | 29  |
| Total     | ..  | 128 | ..    | 125 |



TABLE III  
The population of Lundby, 1 July 1957 by age, sex and marital status ( $N = 2,612$ )\*

| Age, 1957 | Men (1,335) |         |          |         | Women (1,217) |         |          |       |
|-----------|-------------|---------|----------|---------|---------------|---------|----------|-------|
|           | Unmarried   | Married | Divorced | Widower | Unmarried     | Married | Divorced | Widow |
| 0-9       | 169         | 0       | 0        | 0       | 171           | 0       | 0        | 0     |
| 10-19     | 216         | 0       | 0        | 0       | 205           | 4       | 0        | 0     |
| 20-29     | 111         | 58      | 1        | 0       | 53            | 96      | 0        | 0     |
| 30-39     | 45          | 125     | 0        | 0       | 13            | 133     | 3        | 1     |
| 40-49     | 40          | 147     | 5        | 1       | 25            | 160     | 0        | 4     |
| 50-59     | 31          | 158     | 8        | 4       | 34            | 123     | 2        | 13    |
| 60-69     | 14          | 79      | 3        | 3       | 22            | 71      | 2        | 28    |
| 70-79     | 11          | 44      | 0        | 15      | 21            | 29      | 3        | 29    |
| 80+       | 3           | 10      | 1        | 33      | 10            | 5       | 0        | 17    |
| Total ..  | 640         | 621     | 18       | 56      | 554           | 621     | 10       | 92    |

\* This figure does not include emigrants from the Lundby area since 1947.

TABLE IV  
Duration of marriage versus age in the population of Lundby, 1 July 1947  
(Duration of marriage in five-year periods)

| Age, 1947 | 0-4 |    | 5-9 |    | 10-14 |    | 15-19 |    | 20-24 |    | 25-29 |    | 30-34 |    | 35-39 |    | 40-44 |    | 45+ |    | All   |
|-----------|-----|----|-----|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-----|----|-------|
|           | M   | F  | M   | F  | M     | F  | M     | F  | M     | F  | M     | F  | M     | F  | M     | F  | M     | F  | M   | F  |       |
| -24       | 14  | 31 |     |    |       |    |       |    |       |    |       |    |       |    |       |    |       |    |     |    | 45    |
| 25-29     | 33  | 33 | 3   | 18 |       | 1  |       |    |       |    |       |    |       |    |       |    |       |    |     |    | 88    |
| 30-34     | 23  | 11 | 24  | 28 | 7     | 27 |       |    |       |    |       |    |       |    |       |    |       |    |     |    | 120   |
| 35-39     | 12  | 9  | 28  | 15 | 29    | 37 | 8     | 23 |       |    |       |    |       |    |       |    |       |    |     |    | 161   |
| 40-44     | 6   | 5  | 11  | 12 | 33    | 14 | 36    | 30 | 10    | 15 | 1     | 1  |       |    |       |    |       |    |     |    | 174   |
| 45-49     | 2   | 2  | 9   | 6  | 12    | 7  | 18    | 14 | 19    | 23 | 5     | 13 |       |    |       |    |       |    |     |    | 130   |
| 50-54     | 4   | 1  | 2   |    | 6     | 3  | 6     | 4  | 12    | 7  | 21    | 22 | 2     | 18 |       |    |       |    |     |    | 110   |
| 55-59     |     |    |     |    | 1     |    | 3     | 2  | 4     | 5  | 13    | 11 | 20    | 14 | 1     | 8  |       |    |     |    | 82    |
| 60-64     |     |    |     |    | 1     |    | 2     | 1  | 2     | 1  | 8     | 1  | 11    | 6  | 14    | 11 | 9     | 12 | 1   | 1  | 81    |
| 65-69     |     |    |     |    |       |    | 1     |    |       | 2  | 5     | 1  | 3     | 2  | 8     | 7  | 16    | 18 | 3   | 3  | 69    |
| 70-74     |     |    |     |    |       |    |       |    | 2     |    | 1     | 1  | 4     |    | 5     |    | 13    | 10 | 8   | 13 | 57    |
| 75+       |     |    |     |    |       |    |       |    | 1     |    |       |    |       |    | 4     |    | 3     | 1  | 21  | 17 | 47    |
| Total     | 94  | 92 | 77  | 79 | 89    | 89 | 74    | 74 | 50    | 53 | 54    | 50 | 40    | 40 | 32    | 28 | 41    | 41 | 33  | 34 | 1,164 |

among couples from social class I and II an excess of conjoint illness was clearly demonstrable, but this was not so for social class III. However, this finding does not influence the interpretation of Table VI, since the sick and well husbands were found to be mostly similar with respect to social class.

The same table shows that the majority of sick husbands have a sick wife, but most sick wives have a healthy husband. The question of differential susceptibility is considered in more detail below.

#### Concordance and duration of marriage

Among the 328 couples described in the previous table there were an appreciable number who had married since the time of the 1947 survey. However, 269 couples had been married in 1947 and were seen again in 1957. Table VII illustrates the degree of concordance between the husbands and wives at these two points in time. It can be seen that at the earlier survey there is no significant excess of husband-wife pairs, whereas there is a highly significant excess after the ten-year interval has elapsed. The

TABLE V

*Duration of marriage versus age: Survivors of the 1947 cohort at 1 July 1957*  
(Duration of marriage in five-year periods)

|       | 0-4 |    | 5-9 |    | 10-14 |    | 15-19 |    | 20-24 |    | 25-29 |    | 30-34 |    | 35-39 |    | 40-44 |    | 45+ |    | All |     |
|-------|-----|----|-----|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-----|----|-----|-----|
|       | M   | F  | M   | F  | M     | F  | M     | F  | M     | F  | M     | F  | M     | F  | M     | F  | M     | F  | M   | F  | M   | F   |
| 15-24 | 17  | 39 |     | 3  |       |    |       |    |       |    |       |    |       |    |       |    |       |    |     |    | 17  | 42  |
| 25-29 | 45  | 41 | 25  | 30 |       | 2  |       |    |       |    |       |    |       |    |       |    |       |    |     |    | 70  | 73  |
| 30-34 | 22  | 12 | 36  | 16 | 12    | 25 |       |    |       |    |       |    |       |    |       |    |       |    |     |    | 70  | 53  |
| 35-39 | 12  | 3  | 14  | 4  | 32    | 29 | 3     | 16 |       | 1  |       |    |       |    |       |    |       |    |     |    | 61  | 53  |
| 40-44 | 6   |    | 8   | 2  | 20    | 11 | 23    | 27 | 7     | 26 |       |    |       |    |       |    |       |    |     |    | 64  | 66  |
| 45-49 | 1   | 1  | 3   | 1  | 11    | 9  | 26    | 13 | 29    | 36 | 7     | 22 |       |    |       |    |       |    |     |    | 77  | 82  |
| 50-54 | 3   | 2  | 1   |    | 5     | 4  | 10    | 10 | 32    | 11 | 34    | 25 | 10    | 15 |       | 1  |       |    |     |    | 95  | 68  |
| 55-59 | 1   | 1  | 1   | 1  | 2     | 2  | 8     | 5  | 8     | 5  | 17    | 14 | 18    | 22 | 5     | 11 |       |    |     |    | 60  | 61  |
| 60-64 | 2   |    |     |    | 4     | 1  | 2     |    | 3     | 3  | 6     | 4  | 10    | 6  | 17    | 19 | 2     | 13 |     | 1  | 46  | 47  |
| 65-69 |     |    | 1   |    |       |    |       |    | 1     |    | 3     |    | 4     | 3  | 9     | 7  | 18    | 11 | 1   | 4  | 37  | 25  |
| 70-74 |     |    |     |    | 1     |    |       |    | 1     |    | 1     |    | 2     |    | 6     | 1  | 5     | 3  | 11  | 11 | 27  | 15  |
| 75+   | 1   |    |     |    |       |    |       |    |       |    |       |    | 1     |    | 3     |    | 3     |    | 21  | 18 | 28  | 19  |
| 0+    | 110 | 99 | 89  | 57 | 87    | 83 | 72    | 71 | 81    | 82 | 68    | 65 | 44    | 47 | 40    | 39 | 28    | 27 | 33  | 34 | 652 | 604 |

TABLE VI  
*Concordance for marital disorder in married couples*  
(age 20-59)  
1957 survey

|       |      | Husband |        | Total |
|-------|------|---------|--------|-------|
|       |      | Well    | Ill*   |       |
| Wife: | Well | ..      | .. 156 | 42    |
|       | Ill* | ..      | .. 80  | 50    |
|       |      | 236     | 92     | 328   |

$$\chi^2 = 11.68; \text{d.f.} = 1; p < .001$$

\* 'Ill' means that the individual was (a) considered to meet the survey criteria for morbidity, and (b) had displayed symptoms during the marriage whether or not the illness began premaritally.

figures refer to the presence of mental illness at any time during marriage, irrespective of time of onset; thus an individual classified on the first occasion as having an illness must be so classified on the second occasion as well. The point at issue of course is not that the number of individuals who have ever been ill has increased over the intervening ten years (an increase of from 44 to 114 for wives and from 49 to 85 for husbands) but that the number of concordant *pairs* has risen to a significant excess on the second survey date.

These longitudinal data appeared to be suitable for testing the hypothesis that given a sick partner there is a greater risk for wives than for husbands to fall ill. The formal demonstration in the Appendix substantiates this hypothesis. In subsequent analysis attention has therefore been given primarily to the wives, who display the putative interaction effects relatively more clearly.

The effects of duration of marriage were also tested by considering the morbidity among wives of sick husbands at different stages of marriage, considered cross-sectionally, and comparing these figures with the spouses of healthy

TABLE VII  
*Concordance for marital disorder in married couples*  
(age 20-59)  
1947 and 1957

|       |      | 1947                                  |     |       | 1957                                         |     |       |
|-------|------|---------------------------------------|-----|-------|----------------------------------------------|-----|-------|
|       |      | Husband                               |     |       | Husband                                      |     |       |
|       |      | Well                                  | Ill | Total | Well                                         | Ill | Total |
| Wife: | Well | 186                                   | 39  | 225   | 120                                          | 35  | 155   |
|       | Ill  | 34                                    | 10  | 44    | 64                                           | 50  | 114   |
|       |      | 220                                   | 49  | 269   | 184                                          | 85  | 269   |
|       |      | $\chi^2 = 0.76;$<br>d.f. = 1;<br>N.S. |     |       | $\chi^2 = 11.18;$<br>d.f. = 1;<br>$p < .001$ |     |       |

husbands. 'Illness' again refers to any time within the marriage. The main results are illustrated in Fig. 1. It can be seen that in the earlier years of marriage, which had to be set as high as the first 14 years—a longer period

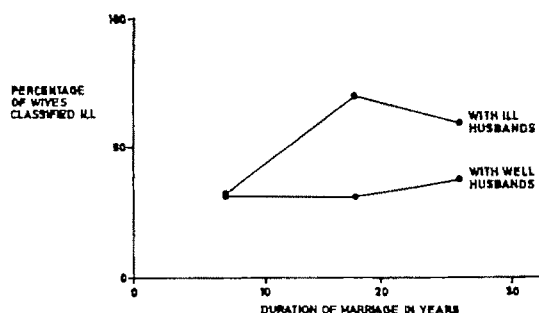


FIG. 1.—Effect of duration of marriage on morbidity in wives.

To obtain duration of marriage categories of approximately equal numbers, it was necessary to use groupings of up to 14, 15–21, and 22+ years. The points on the graph correspond to mid-points of these intervals.

than other studies would suggest is desirable, but one which was dictated by the number of cases available—the two groups of wives have identical morbidity. At later stages the wives of mentally sick men have appreciably higher rates than the wives of the control men. The trend is not directly linear, but the overall pattern is in agreement with other investigations indicating increasing divergence between two such groups of wives as the marriage matures. Although there was no clear evidence that social class made any difference to the duration of marriage effects, it may be added that the two groups of husbands were of similar age and social class distribution.

### *Duration of illness in husbands and the effect of remission*

If the illness in the wife is to be considered as reactive to the illness of the husband rather than to his personality or to the social consequences of his disability, it would be reasonable to expect a higher morbidity among the wives of men who had been ill for longer periods than among the wives of men with comparatively shorter illnesses. To test this hypothesis the illness experience of the 92 sick husbands shown in Table VI were summed over all their episodes of illness which had accrued at any time since the marriage, and the morbidity among their wives calculated for various sub-groups. No differences were found.

However, it was often difficult to obtain dependable data for the onset of many of the more insidious illness and for the duration of some of the episodes. A simpler and more satisfactory approach was to divide the 92 married men into those who were ill at the time of the 1957 survey and those who were not. As shown in Table VIIa, there is a highly significant difference in the morbidity of the wives; where the husband was currently ill 76 per cent of the wives are affected, compared to 22 per cent among those who had remitted.

Further analyses showed that the differences did not reflect discrepancies between the two groups of husbands in terms of age, duration of marriage or social class. An interesting finding emerged, however, in the latter context. It appeared (Table VIIb) that the 'remission' effect in wives was only evident in couples in social classes I and II. It was not demonstrable

TABLE VIIa  
*Proportion of sick wives of male patients (defined in 1947) by husband's remission in 1957 survey*

|                     |    |    |    | Husband currently |              |       |
|---------------------|----|----|----|-------------------|--------------|-------|
|                     |    |    |    | Ill               | In remission | Total |
| Wife currently Ill  | .. | .. | .. | 42                | 8            | 50    |
| Wife currently Well | .. | .. | .. | 13                | 29           | 42    |
|                     |    |    |    | 55                | 37           | 92    |

$$\chi^2 = 26.72; \text{d.f.} = 1; p < .001$$

TABLE VIIIb  
As for Table VIIa, subdivided by social class

|                               | Social class I and II |              |       | Social class III  |              |       |
|-------------------------------|-----------------------|--------------|-------|-------------------|--------------|-------|
|                               | Husband currently     |              |       | Husband currently |              |       |
|                               | Ill                   | In remission | Total | Ill               | In remission | Total |
| Wife currently ill .. ..      | 26                    | 3            | 29    | 16                | 5            | 21    |
| Wife currently in remission.. | 7                     | 23           | 30    | 6                 | 6            | 12    |
|                               | 33                    | 26           | 59    | 22                | 11           | 33    |

$$\chi^2 = 26.31; \text{d.f.} = 1; p < .001 \quad \chi^2 (\text{Yates}) = 2.32; \text{d.f.} = 1; \text{N.S.}$$

in social class III although there was a trend in the same direction.

### Diagnosis

An attempt was made to ascertain whether any particular type of illness in the husbands was particularly associated with raised morbidity among the wives. Unfortunately, with the numbers available the only classification which could be used was to group male psychopaths and personality disorders together and compare them with the remaining cases. No difference in the morbidity level of the wives could be demonstrated.

The diagnoses of the 50 married pairs in which both partners were ill are shown in Table IX. There were only four individuals with

psychotic illnesses, and in none was the partner similarly diagnosed. Fifteen of the couples were concordant for neurosis, and there is considerable overlap between neurosis in the wife and alcoholism, psychopathy or personality disorder in the husband.

These data are best regarded as primarily of descriptive interest, since the distinctions between categories such as neurosis and personality disorder are too hazy to warrant statistical testing.

### Personality variables

All patients in both surveys were assessed clinically, using the Sjöbring system (Sjöbring, 1973). This considers four aspects of personality, namely capacity (which is equivalent to intelligence), validity (corresponding to confidence, self-reliance), solidity (long range organization) and stability (emotional detachment). Subjects were rated as low, average or high on each of these four variables.

Two analyses were carried out. Firstly, the 328 couples in the 1957 survey were considered. In 156 of these where both partners were healthy significant correlations on personality measures were obtained for capacity ( $p < .001$ ) and solidity ( $p < .01$ ). In 80 pairs where the husband was healthy but the wife was sick only one significant correlation emerged, namely on capacity ( $p < .001$ ). Where the husband was sick but the wife was healthy (42 couples), or where both partners were ill (50 couples), none of the variables yielded significant concordance. It is difficult to be certain that the effects of

TABLE IX  
Principal diagnosis in married couples  
(aged 20-59)  
1957 survey

|                                             | Husbands |     |     |     |     | Total |
|---------------------------------------------|----------|-----|-----|-----|-----|-------|
|                                             | (a)      | (b) | (c) | (d) | (e) |       |
| Wives:                                      |          |     |     |     |     |       |
| (a) Psychotic ..                            | 0        | 3   | 0   | 0   | 0   | 3     |
| (b) Neurotic ..                             | 1        | 15  | 10  | 10  | 0   | 36    |
| (c) Alcoholism ..                           | 0        | 0   | 0   | 0   | 0   | 0     |
| (d) Psychopathy and personality disorder .. | 0        | 5   | 2   | 2   | 2   | 11    |
| (e) Organic syndrome ..                     | 0        | 0   | 0   | 0   | 0   | 0     |
| Total ..                                    | 1        | 23  | 12  | 12  | 2   | 50    |

illness were not overlaying the total personality picture and making assessment more difficult in such individuals, but the trend of the findings is to suggest that concordance on personality is more evident for healthy pairs than for those in which either or both partners are ill.

Secondly, data were available on 33 healthy wives whose husbands were regarded as ill in the 1947 study. Of these women 18 subsequently continued well, while 19 became ill. An attempt was made to see whether the two groups of wives could be distinguished on the grounds of their personality characteristics, but no positive results were obtained. It will be appreciated that it was not possible with these numbers to control for variations in the husbands' clinical state at the same time.

#### DISCUSSION

This investigation is, we believe, unique in that the data were collected by a total population survey carried out on each occasion by an experienced psychiatrist. The design is also a little unusual in that other studies of conjoint mental illness have generally used annual inception rates for husbands and wives, e.g. Penrose (1944), Kreitman (1962), Nielsen (1964), Hall *et al.* (1971). This was not judged useful in the present context, since the dates of onset of illness could not be ascertained retrospectively with sufficient precision to exploit such a design, but the increase in the number of 'ill' individuals over the ten-year period between the two prevalence studies does approximate to a 'ten-year inception rate'. Moreover, the longitudinal character of the data, where relevant, seemed to us to be just as clearly demonstrated by the method adopted, which is analogous to that of Buck and Ladd (1965).

The number of married pairs in which both partners were judged to be or to have been ill since the marriage was found to be significantly in excess of the number to be expected by chance alone. This finding is in keeping with all previous investigations, but the role of social class does not appear to have been previously reported in any detail. The excess number of concordant pairs was provided by social classes I and II, with little or no contribution from social class III. One possible interpretation is that

wives in social class III are subject to numerous stresses, so that the influence of the sick husbands on the wives' psychological health is overwhelmed by various other aspects of the environment.

This view is supported by other data. The 1957 survey was unusual in finding no overall association between social class and mental illness, and possible reasons for this have been presented elsewhere (Hagnell *op cit.*). Within the married couples, however, the picture was different. While there was no excess of illness among the married men of social class III (in fact there was a slight trend in the reverse direction\*) for the wives there was indeed a significantly greater prevalence (39 per cent for class I and II, 63 per cent of class III) ( $p < .001$ ). This is in line with the suggestion that concordance effects are 'buried' under the high rate of morbidity due to other causes, and hence no longer separately demonstrable in statistical terms. Different surveys might therefore produce different findings if they vary in the social class composition of the population studied.

The role of duration of marriage in increasing the morbidity in wives of sick husbands as compared to wives of healthy husbands, and the increasing emergence of concordance for mental illness in married pairs has also been reported previously (Kreitman, 1964, 1970; Buck and Ladd, 1965; Hare and Shaw, 1965b) although not found in studies such as those by Ovenstone (1973) or by Rae and Drewry (1972) studying alcoholics. Of these investigations only that by Buck and Ladd attempted to use longitudinal methods, and even so only a short follow-up was possible. The present results add considerable weight to the positive evidence which is accumulating on 'duration of marriage effects'. They also confirm the impression gleaned from early investigations that wives are more susceptible than husbands to illness in the partner (see Appendix).

On the other hand, attempts to relate morbidity in wives to the accumulated duration of illness in the husband (since the time of the marriage) have failed to produce positive or con-

\* For classes I and II, 30 per cent morbidity, for class III 25 per cent.

sistent results. It is thus possible that some other variable, such as the husband's personality, is of more importance than the duration of overt symptoms, but the methodological difficulties encountered in attempting to measure the duration of illness lead us to suspend judgement on this matter.

It was less difficult to decide whether a husband considered ill in 1947 could be classified as in remission at the time of the 1957 survey, and using this criterion the results are unequivocal; morbidity is much higher in wives of men who are currently ill. A causal link seems very likely, though it remains possible that some intervening variable will yet be uncovered. The differential effect of social class has again emerged as important and again suggests that social class III wives fail to show remission effects since they are likely to be experiencing numerous other environmental pressures which sustain the illness, even in the minority of cases where it was the disorder of their spouse which first led to the breakdown.

Diagnostic aspects have been touched on in two contexts. We failed to find any significant difference in morbidity between the wives of psychopaths and men with personality disorder on the one hand and the wives of husbands with other diagnoses on the other. This is somewhat at odds with other reports; we are inclined to attribute the negative finding to the presence of alcoholics in the 'other diagnoses' groups, since their influence on their spouses is probably analogous to that of psychopaths. Data have also been presented on the diagnoses of husband-wife pairs in which both partners were classified as ill. The high frequency of neurosis, and the difficulties of differential diagnosis between some neurotic syndromes and personality disorders, especially under survey conditions, make it difficult to draw any firm conclusions. The question of diagnostic similarity is probably better studied using non-random samples from hospital referrals (Penrose, 1944; Kreitman, 1968).

Studies of personality in normal married couples are numerous, but we are aware of only one other morbidity survey which has included personality assessments. The present results are therefore of particular interest, even though only

four personality dimensions are included in the Sjöbring system and the ratings were necessarily based on limited information. The findings tend to support earlier reports that assortative mating is characteristic of normal couples but not of pairs containing one or more ill individuals. However, much may depend upon the point in the marriage at which the personality assessments are made, since husband-wife correlations are not stable. For additional data and discussion of the rather complex questions involved the reader is referred to Kreitman (1964), Hare and Shaw (1965a, 1965b), Kreitman *et al.* (1970). Since personality variables are likely to be important in determining whether or not a wife with a sick husband will herself become ill (Ovenstone *op cit.*), the matter clearly requires more investigation.

Finally, it seems to us that the entire area of psychopathology in relation to marriage can be fruitfully explored by epidemiological methods, preferably supplemented by intensive studies of the psychosocial context of the marriage and the marital relationship itself. Ideally these two approaches should proceed hand in hand; they may remain in contact, if not all the way, at least for a substantial distance.

#### SUMMARY

1. Findings concerning mental illness in husbands and wives are reported from two total population surveys carried out in the same region of southern Sweden in 1947 and 1957. All the survivors of the 1947 study were re-interviewed at the later date, irrespective of domicile.

2. In 1957 a highly significant excess of couples in which both partners were considered to be ill (at any time since the marriage) was found. The excess in number of concordant pairs was uninfluenced by age. Upper and middle social class couples showed an excess of conjoint illness very clearly, but none was found for those in the lower social class.

3. There were 269 couples who were seen in both surveys. In 1947 these couples had no tendency to conjoint illness, but by 1957 they showed a highly significant ( $p < .001$ ) excess over the number to be expected, given the proportions of sick husbands and sick wives.

4. There was a general tendency for the wives of sick husbands to show a progressive increase in morbidity with increasing duration of marriage.

5. Chronicity of illness in the husbands could not be shown to influence the morbidity of wives, but the dating of the onset of illness was often very uncertain. On the other hand, remission of illness in the husband was clearly related to lower illness rates in the wives, except in the lowest social class.

6. Diagnostic data are presented, but these did not warrant detailed analysis. Significant correlations on personality dimensions, using Sjöbring's system, were found for two of four dimensions among healthy pairs, on one dimension when the husband was well but the wife ill, and on none in the remaining categories.

7. Methodological points are briefly considered. Attention is drawn to the special situation of lower class wives. The contribution of duration of marriage and chronicity of illness are reviewed in conjunction with findings from the literature.

8. A statistical Appendix demonstrates that the risk of a healthy wife becoming ill if her husband is ill is significantly greater than that for the healthy husband of a sick wife.

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# APPENDIX

Let the following six probabilities be denoted by  $p_1, p_2, \dots, p_6$  respectively:

- (i) The probability that a wife whose husband was well at the beginning and end of the period of study becomes ill.
- (ii) As (i) above substituting 'husband' for 'wife' and *vice versa*.
- (iii) The probability that both partners initially well become ill.
- (iv) The probability that a wife whose husband was initially ill becomes ill.
- (v) As (iv) substituting 'husband' for 'wife' and *vice versa*.
- (vi) The probability that a wife whose husband was initially well becomes ill, irrespective of husband's state at the end of the period.

The hypotheses it was decided to test were as follows:

- A:  $p_6 = p_4$  (i.e. husband's initial state did not influence wife's development of illness.)
- B:  $p_1 p_2 = p_3$  (i.e. when both partners were initially well development of illness in the one did not influence the other towards development of illness.)

- C:  $p_1 = p_2$  (i.e. when one partner was well at the beginning and end of the period the development of illness in the other partner was independent of the latter's sex.)
- D:  $p_4 = p_5$  (i.e. when one partner was ill at the beginning of the period the development of illness in the other was independent of the latter's sex.)

It is clear that probabilities  $p_1, p_2, p_3$  and  $p_4$  involve only those couples in which both partners were initially well. Similarly  $p_4$  and  $p_5$  involve only those couples in which the partners were initially discrepant.

The following table was constructed in order to test hypothesis A. Couples figuring in this table are those in which the wife was initially well.

TABLE 1

|           |                 | Finally   |          |       |
|-----------|-----------------|-----------|----------|-------|
|           |                 | Wife well | Wife ill | Total |
| Initially | Husband well .. | 137       | 49       | 186   |
|           | Husband ill ..  | 21        | 18       | 39    |
|           |                 | 158       | 67       | 225   |

Applying Yates' correction a value of  $\chi^2 = 5.14$  was obtained, which on hypothesis A is distributed as  $\chi^2_1$ , hence the above results are significant evidence against A ( $p < .05$ ).

The table indicates that initial illness in the husband tends to be associated with an increase in the probability of the wife developing illness.

Similarly to test hypothesis B we obtain from Table 2 a corrected value of  $\chi^2 = 5.67$ , which is again significant ( $p < .02$ ). Couples figuring in Table 2 are those in which both partners were initially well.

TABLE 2

|      |         |    |    | Husband |      |       |
|------|---------|----|----|---------|------|-------|
|      |         |    |    | Ill     | Well | Total |
| Wife | Ill ..  | .. | 14 | 35      | 49   |       |
|      | Well .. | .. | 17 | 120     | 137  |       |
|      |         |    |    | 31      | 155  | 186   |

From Table 2 it would appear that there is a tendency for development of illness in one partner over the period to be positively associated with the development of illness in the other.

To test hypothesis C we may compare the off-diagonal cells in Table 2 by means of a binomial test. Approximating by the normal distribution we obtain a value of  $z = 2.50$  ( $p < 0.02$ ), indicating that significantly more wives (whose husbands remained well) developed illness than did husbands whose wives remained well.

Table 3 was constructed to test hypothesis D, and again a significant value of  $\chi^2$  ( $\chi^2 = 6.9$ ,  $p < .01$ ) was achieved. The table indicates that a greater proportion of wives with ill husbands develop illness than do husbands with ill wives.

TABLE 3

|           |                           |    | Finally          |           |       |
|-----------|---------------------------|----|------------------|-----------|-------|
|           |                           |    | Well partner ill | No change | Total |
| Initially | Husband well, wife ill .. | 5  | 29               | 34        |       |
|           | Husband ill, wife well .. | 18 | 21               | 39        |       |
|           |                           |    | 26               | 47        | 73    |

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# Learning Clinical Psychiatry in a Provincial Mental Hospital

By BRIAN BARRACLOUGH and GODFREY WACE

I hold every man a debtor to his profession; from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of amends, to be a help and ornament thereunto.

FRANCIS BACON.  
*Maxims of the Law.*

Postgraduate teaching in psychiatry has always been a function of the provincial mental hospitals, but nothing before has equalled the expansion of theoretical teaching which has taken place over the past ten years. At the heart of the training of a psychiatrist, however, there is the National Health Service job with its own demands, where the practical clinical skills are acquired. The job has not changed much, even though the arrangements for theoretical instruction have improved. Yet changes may be possible which will make the registrar's job more efficient as an educational experience by removing the unsystematic and random elements.

With this aim in mind we examined the teaching of psychiatry in a mental hospital, using an educational technology approach to discover where improvements might be made. We report the more important findings here, believing that those responsible for teaching clinical psychiatry, and those being taught, may find them useful.

The survey was commissioned by the Chichester and Graylingwell Hospital Management Committee, who requested Educational Systems (Bristol), Ltd. (ESL) to examine the existing provision for psychiatric training at Graylingwell Hospital and advise about practical steps to improve it. The study was to be directed to the registrars' requirements, because that is the training grade in which the basic skills are acquired and the examinations prepared for. This paper is based on their report.

Before discussing the survey itself, ESL and Graylingwell Hospital will be described briefly.

ESL specialize in the analysis of factors influencing training for jobs in industry and advise about the most effective training methods,

including the provision of audio-visual aids. It may be thought that methods applied in industry are not suited to medicine, but although that is true for some aspects, the general principles are relevant to any setting where the acquisition of new knowledge and behaviour can be defined. A formal test of clinical ability, the Membership examination for example, implies a belief that such acquisitions can be defined, and it is to the definable aspects that the survey was directed.

Graylingwell Hospital has 800 beds and is staffed by four registrars, two senior registrars, one medical assistant and six full-time consultants. The provision for postgraduate training may compare quite well with that of other hospitals. It comprises 33 whole days attendance per year at the Wessex Regional School of Psychiatry, which is forty-five minutes drive away; case conferences; journal clubs; visiting speakers; weekly psychotherapy supervision, and clinical instruction from consultants. A reasonable library is maintained. The training is directed by a salaried (£400.00 per annum) tutor, appointed and paid by the British Postgraduate Medical Federation (University of London).

Now to discuss the aims of the survey and the method employed.

The specific aims of the survey were:

- (1) To consider the skills, knowledge and attitudes expected by consultants and registrars as the outcome of the training.
- (2) To analyse the present learning situation and recommend changes in methods of clinical training within the constraints of the hospital setting.
- (3) To investigate the influence of the professional examination upon registrars' work habits.

The method comprised structured interviews, conducted by G.W. and analysed in the light of learning theory (3, 4) and his practical experience with it in industrial settings.

The following people were interviewed: 4 Registrars; 2 Senior Registrars; 5 Consultants; 2 Clinical Tutors; the Principal Social Worker; the Head of the Psychology Department; the Regional Advisor for Postgraduate Psychiatric Training, Wessex Regional Hospital Board; the Professor of Psychological Medicine, University of Birmingham.

Two teaching seminars were attended, and three registrars kept diaries of their work for five consecutive days.

#### EXPECTED KNOWLEDGE, SKILLS AND ATTITUDES

Both consultants and registrars agreed that the study of theoretical aspects of psychiatry for the examination is a reasonably straight-

forward matter, and the present arrangements were satisfactory. Certainly the total number of hours worked in a sample week does not preclude private study (see Appendix).

In contrast, the acquisition of clinical skills, knowledge and attitudes appropriate to a practising psychiatrist, as described by the former R.M.P.A. (1), are the most demanding part of the training, and it is here that improvements should be made. We have attempted first to make explicit the educational objectives and the criteria of attainment in the clinical setting, which are applied implicitly by consultants at Graylingwell, and secondly to discuss how the training could be improved.

#### *Objective of registrar performance*

1. Establish a good relationship with the patient.
2. Take histories in a systematic way; obtain and identify the relevant information.
3. Present the case concisely and completely.
4. Make a formulation and differential diagnosis; take decisions for further special investigations.
5. Determine and provide a practical plan for treatment appropriate to the diagnosis.
6. Show consideration towards views of all staff and appreciation of their skills. Conform to the needs of working as part of a team.
7. Recognize own attitudes, prejudices and moods when dealing with patients.
8. Recognize own limitations of knowledge and skill in diagnosis and treatment.
9. Know all the treatment facilities which the hospital can provide.
10. Keep abreast of new developments in medicine.
11. Act in accordance with the accepted standards and modes of behaviour in the profession.

#### *Criteria of attainment of performance*

Patient should feel and possibly say that the registrar understands him. The patient should talk freely with the registrar. The consultant should observe that the registrar spends the appropriate amount of time dealing with his patient. Basic information and all relevant further information should be given during the case presentation and be written down in the case notes. Ideally, the consultant recognizes that no superfluous information has been presented and that he need ask no further questions before commenting on the case. Consultant agrees with formulation and diagnosis and investigations recommended; or, if he does not, recognizes that the registrar's differing opinion is rationally based. Consultant considers that the treatment plan is correct. Patient's progress is generally in accordance with similar cases. Staff respect the registrar's method of working and agree that responsibility appropriate to their skills is delegated to them. Acts responsibly towards and in best interests of the patient during treatment. In case discussions states own attitudes and moods objectively and, in the view of the consultant, correctly. Cases which the consultant or senior registrar believes need their advice are referred on the registrar's initiative. During case discussion, the registrar suggests use of facilities appropriate to each case. Uses information from journals, books and other sources in clinical work. At least a majority of consultants agree that he does so.

These objectives are similar to those accepted as desirable in the R.M.P.A's report on post-graduate training (1). Graylingwell is therefore attempting to train its registrars on agreed lines, and the following analysis and recommendations will be applicable in other hospitals using the R.M.P.A's report as a guide for training.

#### ANALYSIS AND RECOMMENDATIONS

The first four sections are directed to the registrar as an individual, the second four to various aspects of the hospital setting which promote educational standards.

##### 1. *Defining and agreeing objectives*

Defining and then making explicit objectives in the way outlined is essential, for it makes clear to the registrar what is expected of him; the objectives are behavioural, unambiguous and can be agreed. But it is not enough that objectives be merely stated, there must be agreement between teacher and taught, and both must then act in accordance with the agreement. Failure to agree, covertly or overtly, by either party results in continuing discontent and can completely undermine a teaching programme.

It is recommended that, at the start of his training and at intervals subsequently, discussions should be held between registrars, consultants and tutor to ensure that a common understanding is reached about both objectives and criteria of attainment.

##### 2. *Learning clinical skills*

A useful approach is the stimulus response model. The stimulus to learn is the patient's illness, which presents a 'problem', and the registrar learns by solving that problem. The range of stimuli must be diverse because several 'problems' of any one type have to be experienced before the learner can identify the characteristics that are uniquely relevant to defining that type. Thus, a wide clinical experience is important, but it must be organized experience or inessentials may be mistaken for essentials, or worse, no useful abstracting may take place.

The registrar's response to the stimulus is a plan of clinical management. Rapid feedback is known to be an effective way of ensuring that learning takes place because it reinforces correct responses and extinguishes wrong ones. The patient's progress can provide that feedback, but on such a long time scale it may be ineffective. Immediate feedback from the consultant, provided from his experience, can provide a vicarious reinforcement and thereby speed up the acquisition of skills and prevent the learning of less than optimum clinical habits. 'The arrangement of contingencies of reinforcement is the main task of the teacher' (4). The consultant's approval is without question the most powerful reinforcer of the registrar's response, in the clinical setting.

Feedback given to registrars about their clinical decisions is insufficient at Graylingwell. Some means must be found of overcoming the registrar's clinical isolation, but without encroaching on consultant's time. The most efficient method seems to be the teaching ward round. However, because of demands made on the consultants' time an alternative solution is worth consideration. Clinical methods are regarded by the Wessex Regional School as the hospital's teaching responsibility, but the National Health Service demands on consultants' time make it unlikely they can give any more to individual clinical instruction. There is therefore a good case for at least some aspects of clinical instruction being taken out of the mental hospital and becoming the Regional School's responsibility; they have the means to expand.

Another factor which limits the consultants' influence is interest in teaching. There seems no reason why everyone should either be dedicated to teaching registrars or have a special aptitude for it. Such factors need consideration when registrars are inducted and it is recommended that one consultant might take special responsibility at least for the initial clinical teaching, and perhaps even from then on.

##### 3. *Attitudes*

Attitudes will be formed or changed by the registrar's work experiences in a random way,

but positive formal steps can also be taken. It is generally accepted that attitudes, or subjective systems about values, are best influenced by small group discussions, which are based on factual knowledge and led professionally. The best size of such a group is five or six people, and it needs to meet frequently enough to form itself into an effective unit for discussion (6). Informal and casual discussion between students is an important means of attitude formation at University, but the small size of the registrar group even in a large mental hospital makes spontaneous group conversation on serious matters an infrequent event, a grave disadvantage which the District General Hospital will not improve. Furthermore, such discussions are not 'led', and hence attitudes may be formed on inadequate or partially understood information.

Forming correct attitudes is especially important in psychiatry, because lack of objective knowledge may lead to the extremes of adopting either an excessively nihilistic approach or some attractive system with wide explanatory powers. It is important, therefore, that the reasons for believing one particular set of facts rather than another should be understood.

Discussion on particular patients at ward rounds affords one opportunity to guide the registrar's thinking. Guidance is in the hands of the consultant, because he can select for the discussion both the cases and the points on which he invites comment, when his own outlook will have an important influence. The other available approach, extended discussion of a selected paper at the Journal Club, under skilled leadership, affords opportunities for coming to grips with the scientific method. Yet neither of these approaches to forming attitudes is as satisfactory as a rigorous discussion group comprising the registrars' peers and expertly led. This deficiency is probably the most serious of the provincial mental hospital's; and it cannot be overcome at present.

#### 4. *Assessment of progress*

Assessments of the registrar's performance in the acquisition of clinical skills are made by consultants, but are not communicated for-

mally to the registrar as they should be. Although it is not appropriate to treat a qualified doctor as a student, subject to termly reports, nevertheless courteously discussing with him how his performance is judged and what shortcomings need correction is very important.

Indeed, regular discussions between registrar and clinical tutor, modelled on the lines of the so-called 'appraisal interview' provide a most effective means of achieving a common understanding about under-achieving and what to do about it. The 'appraisal interview' is a structured discussion in which the trainee's performance is frankly discussed with him. It may be preceded by a meeting of a small assessment panel, and is a technique much used in industry because it is useful and fair and seen to be so (5).

#### 5. *The Clinical Tutor*

His main job is to be an organizer of 'learning situations', not only arranging seminars, discussion groups and formal courses, but also ensuring that the learning resources of the hospital are deployed in the optimum manner for the registrar to meet his training objectives. He is the man who makes things happen, namely:

- (1) Arranging that all are agreed on objectives and the criteria of their attainment.
- (2) Assessing the registrar's progress, at regular defined intervals, and then informing him of the results.
- (3) Ensuring that all the necessary facilities are available for the registrars, especially for the special subjects.
- (4) Maintaining a record of each registrar's training experience.
- (5) Leading the discussion in seminars concerned with attitudes, or ensuring that a suitably qualified person does.
- (6) Ensuring that the standard of the hospital's library is maintained, and that self-instructional material is made available.
- (7) Agreeing with the Regional School who should teach what.

#### 6. *The Senior Registrar*

Because the senior registrar has recently been a registrar himself he should be able to under-

stand the registrar's difficulties, and provide effective help in the early stages of training with learning history-taking, the interpretation of symptoms, and especially the organization of the working day in a novel and puzzling institution. However, at Graylingwell, the relationship between the registrar and senior registrars appears to be the same as that between registrar and consultant and hence is affected by the same considerations. In any reorganization of training that takes place, one of the senior registrar's functions should be the early education of registrars.

#### 7. *The regional school*

The Wessex Regional School is considered by registrars to provide an 'examination passing' service. If that is true, it is a restrictive view of its potential, and more use might be made of the expertise available to it. For example, the theory of interviewing might be taught at the school, so that observation of the consultant's methods and discussion with him rests on a foundation of knowledge. The school might also provide self-study material and advice about access to it, and, as already touched on, the teaching of clinical psychiatry could be expanded there by taking advantage of the larger number of clinicians who could be employed. A store of videotaped material, cases illustrating rare signs and symptoms or the progress over time of common and uncommon disorders would rapidly extend the registrar's knowledge.

#### 8. *The provision of self-study material*

Some specialized self-study material is available for psychiatry, but there is nothing which covers the examination syllabuses systematically. Programmed material for the whole course would be too expensive, and in any case it is unlikely to be acceptable to postgraduate students accustomed to freedom in study methods. Nevertheless, the numbers of postgraduate students and the relative isolation in which they work does justify consideration being given to providing a 'Study Guide'. The guide should contain reference to information sources and how to use them; this means, the places from which books, journals, pro-

grammed texts, audio-tapes, tape-slides, films and video-tapes may be borrowed, and a bibliography of those relevant to psychiatry and its basic sciences. The College's Reading List (2) is a first step in that direction, and the projected Book List a useful second step. Some existing audio-visual material is relevant, but its value would be enhanced if tutorial comments for clinical tutors were prepared for use with it. But for most aspects of the subject new material is required. Preparing it needs special skills and experience in producing self-study material and the ability to work closely with subject matter experts. There is no reason why psychiatry could not be supplied either by commercial enterprise or from the College's own resources, with expert advice.

#### THE EXAMINATION'S INFLUENCE

'In an examination, those who do not wish to know ask questions of those who cannot tell.'

It is a truism that the syllabus of a course and the subsequent examination control the learning of students. Any change made in either the M.R.C.Psych. or D.P.M. will be a powerful tool for manipulating registrar behaviour for better or for worse. Present learning, for example, is divided into two parts, one examination-directed, the other clinically set; their differing requirements undoubtedly conflict. In the early part of a registrar's career, theoretical instruction in basic sciences is given at the Regional School and studied at night, while on the wards the registrar may grope to grasp the fundamentals of psychopathology. With the first part of the examination looming, which takes priority? A section of the examination directly related to the registrar's everyday clinical work would offer a clear guide to the behaviour expected in his work and substantially increase effort on clinical problems. The extended description and discussion of a series of clinical cases required by the Australasian College of Psychiatrists is an example of a technique which would concentrate attention on clinical matters. Clinical research presented as a dissertation, as required for the University of London M.Phil. also deserves serious consideration as a method of increasing the importance of clinical matters.

## DISCUSSION AND CONCLUSIONS

Can results derived from one mental hospital and its four registrars' experiences be generalized, for that would be the justification for the study? Almost certainly they can, for British mental hospitals are very similar to one another in those aspects which have a bearing on the standard of training. Graylingwell is atypical because of its M.R.C. Unit, but what is not up to standard at Graylingwell may be even harder to achieve in hospitals less well endowed.

The recent improvements in postgraduate psychiatric education in the provinces, the result of injecting public money into the field, giving enhanced status to clinical tutors and inflicting the penalty of insufficient staff on hospitals showing no interest, have concentrated more on academic instruction. That is because lectures and seminars are easy to mount and there is no difficulty in releasing psychiatric registrars to attend them. Nobody seriously suffers as a consequence. The apprenticeship in basic clinical skills, on the other hand, may not have improved to the same extent. This study at Graylingwell is in accord with that view and emphasizes that the most important of the agents for change is the consultant. In this way, one of the most ancient themes in medicine, the responsibility of the physician to his pupil, is underlined and the Baconian motto justified. Our most important recommendation is the need for consultant and registrar to be agreed on goals and the especial requirement for feedback to the registrar both on his daily clinical work and his progression towards those goals. Consultant and registrar may need to spend more time together, although for the consultant it need not necessarily be at the expense of patient time. If this provision cannot be met—and there may be sound practical reasons why it cannot—the present arrangements for postgraduate education are placed in jeopardy. Serious consideration may then have to be given to confining training to fewer hospitals—those which have a greater commitment to teaching.

The clinical apprenticeship is an informal learning situation, and it needs to be monitored and in some degree, controlled by a person who is educationally aware. This is the clinical

tutor's role, but he should also maintain a close liaison with the school that provides the formal instruction.

The Regional School is the one element in the present arrangement which may be able to expand its teaching substantially. We think the School should consider providing clinical instruction and give more time to seminars directed to influencing the registrars' attitudes to psychiatry.

The importance of the examination's influence on the registrar's conduct of his training period can hardly be exaggerated. In its present form, tremendous emphasis is placed on book knowledge; this may not always further the aim of producing a sound clinician with practical skills and the scientific approach.

## SUMMARY

The clinical teaching of psychiatry to registrars in a provincial mental hospital was assessed with an 'educational technology' approach. Teaching methods based on learning theory and which relate the academic aspects of training more closely to clinical work are considered likely to be more efficient than present methods.

## ACKNOWLEDGEMENT

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## APPENDIX

*Analysis of professional activities during a working week of five days*

|                                                                                   | Registrar    |              |              | Average of<br>three (to<br>nearest five<br>minutes) |
|-----------------------------------------------------------------------------------|--------------|--------------|--------------|-----------------------------------------------------|
|                                                                                   | A            | B            | C            |                                                     |
| <i>Psychiatric activity</i>                                                       | <i>h. m.</i> | <i>h. m.</i> | <i>h. m.</i> |                                                     |
| Interviewing patients .. .. .                                                     | 18.55        | 11.00        | 12.05        | 14.00                                               |
| Ward visits .. .. .                                                               | 2.25         | 1.10         | 4.25         | 2.40                                                |
| Consultant discussion or observation .. .. .                                      | 3.15         | 0.15         | 1.00         | 1.30                                                |
| Lectures and trial examinations (Wessex Regional School<br>of Psychiatry) .. .. . | 4.00         | 3.20         | 3.00         | 3.25                                                |
| Other learning .. .. .                                                            | 1.00         | 1.05         | 3.20         | 1.50                                                |
| Journal Club .. .. .                                                              | 1.10         | 1.30         | 0.00         | 0.55                                                |
| Group psychotherapy supervision .. .. .                                           | 0.00         | 6.45         | 3.15         | 3.20                                                |
| <i>Hours spent in psychiatric activity</i> .. .. .                                | 30.45        | 25.05        | 27.05        | 27.40                                               |
| <i>Miscellaneous</i>                                                              |              |              |              |                                                     |
| Administration                                                                    |              |              |              |                                                     |
| Seeing relatives                                                                  |              |              |              |                                                     |
| Meals                                                                             |              |              |              |                                                     |
| Free time                                                                         |              |              |              |                                                     |
| Physical examinations                                                             |              |              |              |                                                     |
| Getting from place to place                                                       |              |              |              |                                                     |
| Approximate hours spent in miscellaneous activity .. .. .                         | 20.00        | 18.00        | 22.00        | 20.00                                               |
| Approximate total hours .. .. .                                                   | 51.00        | 43.00        | 49.00        | 48.00                                               |

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## The Control of Deviant Sexual Behaviour by Drugs:

### 1. Behavioural changes following Oestrogens and Anti-Androgens

By JOHN BANCROFT, GAVIN TENNENT, KYPROS LOUCAS and JAMES CASS

Drugs have been used to control deviant sexual behaviour in recidivist sexual offenders for over 20 years. Oestrogens have been most widely used (Golla and Hodge, 1949; Whittaker, 1959; Scott, 1964) and generally have been considered to be effective though limited by their side effects, in particular nausea, vomiting and feminization. A further uncommon but grave complication has been carcinoma of the breast (Symmers, 1968). Recently, oestradiol implants have been used (Field and Williams, 1970). A similar libido-reducing effect has been claimed with some tranquillizers, notably thioridazine (Litkey and Feniczy, 1967; Bartholomew, 1964), fluphenazine enanthate (Bartholomew, 1964) and a new butyrophenone, benperidol (Sterkmans and Geerts, 1966; Field, 1973). Progestogens have been recognized for some time as having libido reducing qualities in both males and females (Heller *et al.*, 1958; Kupperman, 1963; Money, 1970). The use of medroxyprogesterone in treating sexual deviants has recently been reported (Money, 1970); it was found not only to be effective in controlling behaviour but also to produce marked reduction in circulating androgen. Currently, much interest is being shown in the use of an anti-androgen, cyproterone acetate, for this purpose (Laschet and Laschet, 1969; Briggs and Briggs, 1971; Cooper *et al.*, 1972).

Until recently no adequate method of evaluating the effects of these drugs was available. Field and Williams (1970) used a follow-up study in which records of re-offending and subjective reports of continuing deviant interest were the main indicators of outcome. Evaluation of this type presents particular difficulties. Not only is it conceivable that a transient placebo effect may follow the use of

any preparation, but also one is dealing with sexual offenders in many of whom the main motivation for accepting treatment is their wish to avoid further penalties and in whom the desire to lose the deviant sexual interest is difficult to assess.

A method of evaluation which aims to avoid some of these difficulties was reported by Tennent *et al.* (1974). In this study, a double-blind comparison was made of benperidol, chlorpromazine and placebo, the effects being evaluated by a combination of behavioural, attitudinal and physiological methods.

In the present paper, the results of a second study using the same method and comparing the effects of cyproterone acetate and ethinyl oestradiol are reported. The endocrine changes in both studies will be reported in a separate paper (Murray *et al.*, 1974).

#### METHOD

##### *Measures of change*

The following measures were used:

(a) Sexual interest score. Each subject was asked to indicate the frequency of his sexual thoughts in the preceding seven days on a continuous scale from 0 to 5 (see Fig. 1).

(b) Sexual activity score. By means of an interview the subject was asked to report the number of times that masturbation or any overt sexual acts resulting in orgasm had occurred in the previous seven days. Each orgasm scored one point (nocturnal emissions were not included).

(c) Sexual attitude score. The semantic differential technique developed for sexual attitudes (Marks and Sartorius, 1968) was used in each case. Eight sexual concepts were rated, six involving deviant sexual behaviour. Four scales were used to make up the sexual attitude score. These were:

Seductive — Repulsive    Sexless — Sexy  
Exciting — Dull            Frigid — Erotic

As usual, a seven point scale was used, score 1



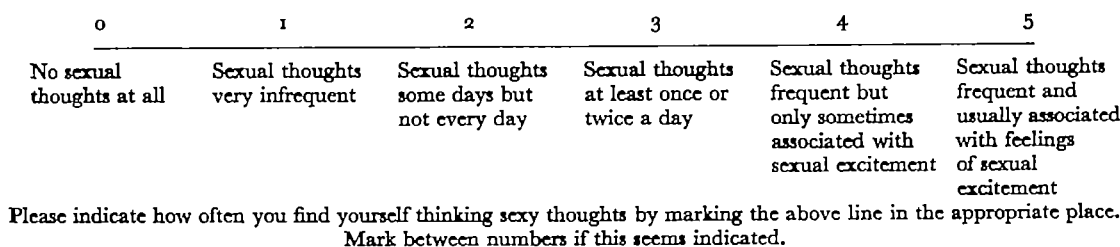


FIG. 1.—Frequency of sexual thoughts.

indicating maximum positive attitude on that scale, score 7 maximum negative attitude, with 4 as a neutral point. Scores of the four scales were summed for each concept and the mean of the six deviant concepts was used in the analysis. This mean had a range of 4 to 28, with 16 as the neutral point.

(d) Responses to erotic stimuli. In the laboratory each subject was exposed to three types of erotic stimuli.

1. Erotic fantasy
2. Erotic slides
3. Erotic film

The fantasy used in each case was of special relevance to the subject. He would be asked to imagine the fantasy as vividly as possible and to sustain it for two minutes. The slide used was made from a photograph chosen by the subject from a large selection as being maximally stimulating for him. The subject was asked to look at the slide and to imagine himself in a sexual situation with the person in the slide and to maintain that fantasy for two minutes. The film shown was a two-minute extract from a pornographic film. Either a homosexual or a heterosexual film was used, depending on the predominant orientation of the subject. Both films involved sexual behaviour of 'normal' type (i.e. normal heterosexuality or normal homosexuality). The subject was asked to simply watch the film.

Two measurements were taken in response to each stimulus.

(1) Penile erection measured as mm. increase in diameter of the penis by means of a mercury-in-rubber strain gauge (Bancroft *et al.*, 1966; Bancroft, 1971). The maximum increase during the two minute presentation of each stimulus was taken.

(2) Subjective ratings of sexual interest in the stimulus on a 0-5 scale (0, no sexual interest; 1, slight sexual interest; 2, moderate sexual interest; 3, strong sexual interest, slightly excited; 4, moderate sexual excitement; 5, strong sexual excitement).

The order of presentation of the three types of erotic stimuli was balanced using repeated Latin square designs.

## SUBJECTS

Twelve subjects, patients at Broadmoor Hospital, volunteered to enter the trial. It had been carefully explained to them that their participation would not influence their release from hospital. It was pointed out, however, that if a drug was found to be effective it might be of value to them when the time came for their release. All twelve subjects met the selection criteria defined in the earlier paper. This ensured that on initial testing there was sufficient scope for change in at least two of the measures, including the physiological measure. Details of the twelve subjects are given in Table I.

## PROCEDURE

The design used in this study was chosen on the basis of the results of the earlier study (Tennent *et al.*, 1974). This earlier design therefore needs brief consideration. A balanced design using three drug conditions (placebo, chlorpromazine and benperidol) was used. The order of presentation of these three drug conditions was controlled using a replicated Williams square design (Cochran and Cox, 1957). The measures of change already described were taken at the end of each treatment period. Two other sets of measurements were also taken, one just before the first treatment ('pre-treatment' score), the other at the end of a 'no-treatment' period. This latter period was not originally planned, but after the first treatment period it was considered advisable to change from liquid to tablet preparations. It was decided to exploit the resulting delay, which was therefore extended to the same length as the treatment periods (i.e. six weeks). This enabled some assessment of the placebo effect to be made. The differences between pre-treatment levels and placebo levels were found to be very similar to those between pre-treatment and 'no-treatment' levels, both showing some change. This made a significant placebo effect unlikely and also suggested that measurements immediately prior to treatment did not provide a reliable baseline. As it was desirable to have a satisfactory baseline for the endocrine measures, it was decided to use a 'no-

TABLE I

| Patient | Age | Years in hospital | Most recent offence                                              | No. of previous sexual offences | Age of victims | Sex of victims |
|---------|-----|-------------------|------------------------------------------------------------------|---------------------------------|----------------|----------------|
| 1       | 24  | 3½                | Indecent assault and attempt to choke                            | 1                               | 10             | Male           |
| 2       | 22  | 9 months          | Attempted buggery and indecent assault                           | 2                               | 14-18          | Female         |
| 3       | 26  | 4 months          | Attempted murder (sexual element)                                | 15                              | 15±            | Female         |
| 4       | 31  | 6 months          | Rape and indecent assault (24 offences taken into consideration) | 4                               | 17-23          | Female         |
| 5       | 19  | 2½                | Rape                                                             | 7                               | 50             | Female         |
| 6       | 34  | 3½                | Indecent assault (15 offences taken into consideration)          | 7                               | 6              | Female         |
| 7       | 26  | 2                 | Rape, wounding with intent                                       | 4                               | 20+            | Female         |
| 8       | 25  | 1½                | Indecent exposure                                                | 7                               | 18±            | Female         |
| 9       | 25  | 5½                | Indecent assault                                                 | 4                               | 6              | Female         |
| 10      | 28  | 2                 | Assault—occasioning actual bodily harm, use of weapon            | 3                               | 20+            | Female         |
| 11      | 27  | 1                 | Manslaughter (sexual element)                                    | 8                               | 13±            | Female         |
| 12      | 26  | 2½                | Attempted rape                                                   | 5                               | 10-21          | Female         |

treatment' rather than a 'placebo' condition in the second study.

Three conditions were therefore involved (no treatment, ethinyl oestradiol, and cyproterone acetate). Otherwise the design was the same as in the first study, using 12 subjects and two Williams squares, each possible order of presentation, therefore, being repeated twice.

Six weeks elapsed between each set of measurements, the drugs being given during the last five weeks only. The drugs were labelled in code by the pharmacist; neither the subject nor staff would know which drug was being administered, and staff carrying out the testing would not know whether a drug condition or 'no-treatment' condition was involved.

The dosage of drugs was as follows:

Ethinyl oestradiol—0.01 mg. b.d.

Cyproterone acetate—50 mg. b.d.  
both in tablet form by mouth.

The sexual interest score and sexual activity score were estimated for each of the last two weeks of each six week period, and the mean of the two scores was taken. The semantic differential was administered immediately before the physiological testing, which was carried out during the last two or three days. Three intravenous blood samples for hormone assay and liver function tests were collected between 8.00 and 9.00 a.m. on the last three days of each period.

#### RESULTS

The mean scores and standard deviations for twelve patients for each of the variables for each of the drug conditions are given in Table

II. The three sets of scores in the balanced design (i.e. excluding pre-treatment scores) were subjected to an analysis of variance. The responses to the three types of erotic stimuli were combined in a two-way analysis of variance, so that interaction between stimulus and drug (stimuli × drug) could be assessed. When a significant F ratio was found, the difference between means was assessed by the Tukey test (Weiner, 1962).

There was no significant difference between the two drugs on any measure.

When compared with no treatment, both ethinyl oestradiol and cyproterone acetate significantly lowered both the sexual interest score and the sexual activity score. Sexual attitudes were not significantly altered. With the physiological testing, self-ratings of response were significantly lowered by cyproterone acetate, but the effect with ethinyl oestradiol did not quite reach significance. There was no interaction between stimulus and treatment, though if the responses to the three stimuli (fantasy, slide and film) were analysed separately the effect of cyproterone acetate was only significant in the case of fantasy and film.

With the erectile responses there was a similar though weaker effect of cyproterone acetate whereas there was no significant difference between ethinyl oestradiol and no treatment.

TABLE II

| Measure                                 | Initial Testing |      | No Treatment |      | Ethinyl Oestradiol |      | Cyproterone Acetate |       | F Ratio d.f. 2,22* |                                |
|-----------------------------------------|-----------------|------|--------------|------|--------------------|------|---------------------|-------|--------------------|--------------------------------|
|                                         | Mean            | S.D. | Mean         | S.D. | Mean               | S.D. | Mean                | S.D.  |                    |                                |
| Sexual interest Score (0-5)             | ..              | 2.89 | 1.0          | 2.9  | 0.89               | 1.58 | 0.84                | 1.67  | 0.61               | F = 9.44; P = <0.001           |
| Sexual activity Score (frequency count) |                 | 2.83 | 2.12         | 3.0  | 2.1                | 1.29 | 1.14                | 0.79  | 0.78               | F = 6.87; P = <0.01            |
| Sexual attitude Score (4-28 range)      | ..              | 6.66 | 2.89         | 7.24 | 3.49               | 9.68 | 4.25                | 10.28 | 5.25               | F = 1.91; N.S.                 |
| <i>Response to erotic stimuli</i>       |                 |      |              |      |                    |      |                     |       |                    | <i>Between conditions</i>      |
| (a) Self ratings (0-5)                  |                 |      |              |      |                    |      |                     |       |                    | F = 6.68; p = <0.01            |
| Fantasy                                 | ..              | 2.33 | 1.67         | 2.33 | 1.67               | 1.42 | 0.99                | 1.17  | 1.27               | <i>Stimuli x conditions</i>    |
| Slide                                   | ..              | 3.0  | 1.86         | 2.17 | 1.58               | 1.42 | 1.16                | 1.0   | 0.74               | F <sub>4,44</sub> = 0.90; N.S. |
| Film                                    | ..              | 3.67 | 1.23         | 3.58 | 1.08               | 2.75 | 0.75                | 2.25  | 0.75               |                                |
| <i>(b) Erections (mm. incr. diam.)</i>  |                 |      |              |      |                    |      |                     |       |                    | <i>Between conditions</i>      |
| Fantasy                                 | ..              | 1.57 | 1.56         | 3.99 | 4.71               | 1.47 | 2.5                 | 1.91  | 2.10               | F = 4.45; p = <0.025           |
| Slide                                   | ..              | 4.17 | 3.64         | 3.96 | 4.58               | 2.33 | 3.04                | 2.04  | 2.83               | <i>Stimuli x conditions</i>    |
| Film                                    | ..              | 4.93 | 3.27         | 5.54 | 4.30               | 5.43 | 4.10                | 4.97  | 5.01               | F <sub>4,44</sub> = 0.69; N.S. |

N.B. None of the differences between the two drugs was significant.

\* Analysis of variance did not include initial testing scores.

Once again there was no interaction between stimulus and drug ( $F = < 1.0$ ), and when the responses to the different stimuli were analysed separately the drug effect was no longer significant with any of the three stimuli.

Although the design of this study was chosen to avoid possible carryover effects from one drug condition to another, an analysis of residual effects (Cochran and Cox, 1957) was carried out on three of the variables, sexual interest score, sexual activity score and erectile response to fantasy. The F ratios for the adjusted residual effects in each case were 2.03, 0.95 and 0.44 respectively with degrees of freedom 2 and 12. None was significant. There was therefore no evidence of carry-over effects on these three variables.

#### SIDE EFFECTS

None of the patients complained of breast enlargement, nausea or other symptoms attributable to the drugs. One patient, at the beginning of the study, became depressed three days after starting on cyproterone acetate and asked to be withdrawn from the trial. He was

therefore replaced by another patient. It is unlikely that this effect was due to the drug.

#### DISCUSSION

In the earlier study (Tennent *et al.*, 1974) the pattern of change effected by benperidol was similar to that of the drugs used in this second study. The only benperidol effect which was significantly greater than placebo was the reduction in frequency of sexual thoughts ( $p = < 0.01$ ). Although, as mentioned already, the results were inconsistent with any marked placebo effect, a weak placebo effect may have been present sufficient to prevent some of the benperidol effects reaching significance.

No direct comparison of the two studies can be justified, but as the same design and measures of change were used in each case it is worth noting that the difference between pre-treatment levels and active drug levels was similar on all measures in the two studies. One cannot exclude a weak placebo effect in this second study, and it seems unlikely, with the dosages involved, that there is much difference in the effects of benperidol, ethinyl oestradiol and cyproterone

acetate. The most important difference is in side effects, these being quite troublesome in the first study and absent in the second. For this reason it would be difficult to increase the dose of benperidol in many cases whereas greater doses of ethinyl oestradiol and cyproterone acetate would be possible. With oestrogens, however, there are the risks of more troublesome and irreversible side effects such as gynaecomastia or thrombosis. At the present time, therefore, cyproterone acetate appears to be the most useful of the three for controlling sexual behaviour.

It is not possible from these studies to establish what the long-term effects of any of these drugs may be, however, and further research investigating differing dose levels as well as longer periods of administration is required before the clinical usefulness of these three preparations becomes sufficiently clear.

#### SUMMARY

The effects of cyproterone acetate and ethinyl oestradiol on sexual behaviour of sexual offenders was assessed using a combination of behavioural, attitudinal and physiological measures. There was no significant difference between the drugs on any measure. They were equally effective in reducing frequency of sexual thoughts and sexual activity, whereas only cyproterone acetate produced a weak effect in reducing erectile and subjective responses to erotic stimuli. The possibility of a placebo effect cannot be excluded. On the dosages used, neither drug produced troublesome side effects. Further work is needed to assess the effects of longer administration and varying dose levels.

#### ACKNOWLEDGEMENTS

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## Synopses of Papers Awaiting Publication

### **Cross-National Study of Diagnosis of the Mental Disorders: a Comparison of the Diagnoses of Elderly Psychiatric Patients Admitted to Hospitals Serving Queens, New York and the former Borough of Camberwell, London.**

U.S./U.K. Diagnostic Project—J. R. M. COPELAND, M. J. KELLEHER, J. M. KELLETT, A. J. GOURLAY, D. W. COWAN, G. BARRON, J. DE GRUCHY—U.K. Team. B. J. GURLAND, L. SHARPE, R. SIMON, J. KURIANSKY, P. STILLER—U.S. Team.

A consecutive series of 75 patients over the age of 65 admitted to psychiatric hospitals serving Camberwell, London was compared with a similar series of 50 patients admitted to psychiatric hospitals serving Queens County, New York, in order to examine the reported preponderance of organic diagnoses made in New York among patients of this age group. A special schedule for mental state was developed for the aged, and satisfactory reliability for the items of this schedule was shown between the two teams. Psychological and social measures were also taken, to be reported elsewhere, and physical examinations were undertaken on a proportion of patients, including laboratory tests and X-rays. Patients were examined shortly after admission and one month and three months later, using all the measures, either in the hospital or at home in the community. Results showed that, while the hospitals' diagnosis in Camberwell and Queens on the patients examined differed as expected according to the national statistics, there were no significant differences in the diagnostic proportions found by the Project on either side. Agreement between Project and hospital in Camberwell was good, while that between Project and hospital in Queens showed a significant difference for the organic patients. A tendency for the Project to diagnose more organic patients in the U.S. than in the U.K. was not significant. When a sample of patients examined in a similar manner in the Camberwell geriatric hospitals and considered mentally ill by the Project was added to the psychiatric patients, the tendency for there to be a higher proportion of organic patients in the Queens hospitals disappeared. This suggests that in Camberwell some psychiatric cases of organic origin are being admitted to the geriatric hospitals.

Some evidence is produced for the validity of the Project diagnosis for depression and dementia, in terms of symptom profiles, discharge rates and days spent in hospital. Disorientation is the symptom likely to distinguish most clearly between dementia and depression, and poor memory that most likely to cause confusion between them; in affective patients, poor memory was in fact the organic symptom most likely to show improvement at follow-up.

### **Evaluation of a Psychogeriatric Service: The Distinction Between Psychogeriatric and Geriatric Patients.** By J. R. M. COPELAND, M. J. KELLEHER, J. M. KELLETT, G. BARRON, D. W. COWAN and A. J. GOURLAY.

The conclusions of early studies on the 'misplacement' of elderly patients in hospital, especially those by Kidd, are questioned. In particular the report of the harmful effects of 'misplacement' on prognosis seems unjustified in view of the evidence provided.

In the present study, 160 elderly patients entering geriatric and psychiatric hospitals serving Camberwell, London, were examined by a team of psychiatrists, psychologists and sociologists using semi-structured and standardized interviews. Reliability between the psychiatrists for psychiatric ratings and diagnosis was established. Social measures, measures of mobility and psychological tests were undertaken. All patients who were available were followed-up at intervals of one month and three months after admission, when each of the measures was repeated, and again at one year using a case register. Sixty-four per cent of the geriatric admissions were shown to suffer from a psychiatric illness. 5.3 per cent of patients entering the geriatric hospital were probably misplaced. None in either facility was classed as definitely misplaced. There were no adverse effects on prognosis demonstrated.

If the separation of elderly patients into geriatric and psychiatric cases must be undertaken, it can be achieved with some accuracy before admission provided both the quantity and quality of the psychiatric and geriatric services are adequate, and that they co-operate. It appears that misplacement does not have the ill effects which had once been claimed, and that, therefore, the psychogeriatric assessment unit would seem to have only a small part to play in overcoming the problem of 'misplacement'. A plea is

made that such units should broaden their scope to include treatment.

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**Urinary Cyclic AMP in 'Endogenous' and 'Neurotic' Depression.** By K. SINANAN, A. M. B. KRATINGE, P. G. S. BECKETT and W. CLAYTON LOVE.

A double blind study to test the hypothesis that the amount of cyclic AMP in a twenty-four hour collection of urine is decreased in endogenous depression while it is normal in neurotic depression is described. A twenty-four hour collection of urine was obtained on admission, two weeks later and six weeks later or prior to discharge, in twenty-seven patients suffering from classical endogenous depression and fifteen patients suffering from classical neurotic depression. Twenty-five controls were subjected to the same urine collections and clinical ratings. The cyclic AMP assay was performed as described by Gilman (1970). The amount of urinary cyclic AMP by control subjects was similar on the first, second and third sampling.

Urinary cyclic AMP excretion was found to be significantly decreased in both types of depression. The urinary cyclic AMP excretion increased to the control values as patients with both types of depression responded to treatment.

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**Psychiatric Morbidity in a North Indian Community.** By V. R. THACORE, S. C. GUPTA and M. SURAIYA.

In 1965 the Department of Social and Preventive Medicine, King George's Medical College, Lucknow, established an Urban Health Centre in the Alambagh suburb of the city and registered 500 families representing a cross-section of the population, with the purpose of training medical students in the practice of community health. A psychiatric clinic was started two years later with the collaboration of the Department of Psychiatry of the College. The situation offered an excellent opportunity to study the mental health status of the family members and to examine the sociodemographic correlates. This was done by a house-to-house survey of the families, obtaining information by means of a prepared schedule. The survey covered a total population of 2,696. Of these, 220 individuals were found to be suffering from mental illness, giving a one-year prevalence rate of 82 per

1,000 population. Prevalence of mental illness was found to be significantly higher in the age group 26-65 years, among the married compared to the unmarried and among those holding semi-skilled and unskilled jobs. The bulk of the patients was formed by those suffering from neurosis, alcoholism, mental retardation and nocturnal enuresis. Hindu and Sikh middle-aged housewives suffered most from neurosis. Habitual excessive drinking was almost totally confined to Muslims holding low-income jobs. While the prevalence of mental retardation was significantly higher among the males, no such sex difference was associated with nocturnal enuresis. Difference in rates of mental illness in the two adjacent but contrasting communities surveyed were noteworthy. The prevalence rates for mental retardation and alcoholism were higher in the slum areas, whereas rates for functional psychosis, neurosis and nocturnal enuresis were relatively higher in the better-off communities.

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**Clinical and EEG Studies of Prisoners Charged with Murder.** By M. V. DRIVER, L. R. WEST and M. FAULK.

Standard EEG recordings were obtained between 1964 and 1969 from 150 male persons in custody charged with murder. Subsequently 97 of these were tried on this charge, the remaining 53 being tried for lesser offences. The EEGs of these two groups were assessed and compared with each other and with records from 20 healthy volunteers. The abnormality most commonly found in each group was of an epileptic or focal nature and there was no significant difference in incidence of total abnormalities in the three groups (approximately 10 per cent). This is a lower incidence than reported by previous investigators, possible reasons for which are discussed.

It is concluded that from the standpoint of present day experience in Great Britain there is no strong case for EEG examination as a routine in these circumstances: the main indication for such examination should be medical rather than forensic.

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**A Repertory Grid Investigation of the Concept of Illness by Parents of Schizophrenic Patients.** By A. LIAKOS, I. PAPAPOSTAS and C. STEFANIS.

The work reported in the paper was performed in

two phases. During the first phase 29 parents of schizophrenic patients and 24 parents of patients suffering from physical illnesses were given a grid the elements of which were physical and mental illnesses. The samples were comparable in age and socio-economic status. Constructs were elicited, and it was found that constructs with highest relationship scores, i.e. the more important for the subjects, were different in the two groups. Important constructs of parents of schizophrenic patients were concerned with psychological features of illness, while important constructs of the group of parents of physically ill patients were concerned with physical features of illness. Mean group intensity scores were not significantly different.

During the second phase of the investigation, 14 constructs frequently used by the subjects of the first groups were used to form a grid, with standard constructs and elements chosen by each subject. The grid was given to new samples of parents as above. The two new groups were matched for sex. Six constructs discriminated the groups significantly. Mean relationship scores for all 14 constructs used were higher in the group of parents of patients suffering from physical illnesses. The difference in the scores of the six constructs which discriminated the groups was mainly accounted for by differences between the mothers. The implications of the above findings are discussed.

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#### **Psychiatric Teaching in the General Hospital.**

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A programme is outlined for psychiatric teaching in the general hospital. The major objectives are to help students learn the psychological evaluation and management of patients. Emphasis is placed upon the medical interview, and upon preparing as complete a list of the patient's problems as possible. Students are encouraged to include a 'psychological systems review' within the medical history, and to consider relationships between the patient's psychological status and other aspects of his illness.

After students have had experience with psychological evaluations of general medical patients, psychiatric syndromes are introduced. Emphasis here is upon diagnosis rather than on treatment. Electives are available in both behavioural science and clinical areas.

An example is presented of a programme in which psychiatric teaching is done on a surgical ward in a general hospital. It is suggested that success teaching

of this type depends upon explicit descriptions of goals and methods, and upon collaboration with colleagues from general medicine who share similar objectives.

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#### **Family Psychiatric Morbidity, Parental Deprivation, and Socio-economic Status in Cases of Mania.** By H. D. CHOPRA.

This paper studies the differences between monopolar and bipolar manic patients in respect of three factors: occurrence of psychiatric illness in first degree relatives, parental loss before the patient's 15th birthday and socio-economic status of the patient. Material comprised 76 hospital cases (65 men and 11 women) of mania from India, and these were classified into three groups: manic depressive manics (MD) with previous episodes of depression with or without mania (9); recurrent manics (RM) with previous attacks of mania only (52); and first-attack manics (FM) without any previous attack of mania or depression (15). Statistical analysis of the comparison between the three groups reveals no significant difference.

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#### **A Study of Intellectual Impairment and Recovery Rates in Heavy Drinkers in Ireland.**

By JANE CLARKE and HELEN HAUGHTON.

A group of heavy drinkers in hospital in Ireland were compared on five measures of intellectual functioning, including verbal and performance tests, with a matched control group. They were tested three times, two weeks, six weeks and ten weeks after admission. The heavy drinkers showed significant impairment on tests of visual/spatial, visual/motor co-ordination and visual reproduction. Although the heavy drinkers showed some improvement over time, they did not recover to the level of the controls even after the third testing. The results are discussed in terms of implications for work and driving.

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**A Token Economy Ward Programme with Chronic Schizophrenic Patients.** By SUSAN J. MUMFORD, I. C. LODGE PATCH, N. ANDREWS and L. WYNER.

The continued care and if possible rehabilitation of the chronic long-stay mental hospital patient occupies much time and presents many problems both clinically and administratively in psychiatric hospitals. Traditional methods of care often appear to foster and perpetuate dependent and 'institutionalized' behaviour. This study describes an attempt to investigate the potential relevance of a behavioural approach—in particular token economy methods—to the management of a typical long-stay ward of severely regressed chronic schizophrenic patients, given normal service facilities and staffing. Despite the proliferation of token economies in the U.S.A. these methods have not been widely applied in this country and the paper is mainly devoted to a description of the project and problems encountered in the institution and maintenance of the programme.

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**Concepts and Methods in Student Mental Health.** By C. J. LUCAS and SIDNEY CROWN.

The theoretical frameworks used in psychiatry as applied to the mental health of students ('college psychiatry') are of crucial importance to all involved in the understanding, assessment and management of 'disturbance' in students. Implicit or explicit models used by tutors, students themselves, and members of medical, psychiatric and counselling services determine in important ways how problems are treated and researched. The current reappraisal of the organization and planning of psychiatric and counselling services in higher education make it essential to examine underlying theoretical assumptions.

The present positions become clearer if seen historically. The early developments in this area were orientated around either an 'illness-fitness' model, or a 'moral-spiritual' model. In the 1950's the recognition of overt forms of psychiatric morbidity, led to nosological and prevalence studies. Later, psychodynamic influences directed attention towards aetiology, and currently a diverse range of models are available. These include the medical model, updated to take account of recent advances in the objective recording of clinical data; psychological models with psychodynamic, psychometric, cognitive or behavioural emphasis; counselling models; and

social-interactional models reflecting advances in the social sub-sciences: social psychiatry, social psychology and sociology. The limitations at the present time, of any one theory, are emphasized.

Current theoretical complexity calls for an eclectic approach to the range of possible therapies. These require critical appraisal with pragmatic considerations in mind.

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**Psycho-social and Electroencephalic Studies of Egyptian Murderers.** By AHMED OKASHA, A. SADEK and S. ABDEL MONEIM.

A psycho-social study was made of 90 Egyptian murderers, 60 from prison, 30 from State mental hospitals, with 30 normal subjects as a control. The highest percentage of murderers lay in the age group between 25–35 years, with a lower incidence in females. The commonest motives were marital and domestic causes, vendetta, adultery, etc., but 21 per cent of murderers appeared motiveless. Urban and rural incidence were almost equal. Of the 60 murderers in the prison group 8 were schizophrenics, 2 depressives, 30 aggressive psychopaths, 2 epileptics and 10 subnormals. Of the 30 mental hospital patients 15 were schizophrenics, 5 depressives and 3 epileptics.

The EEG was performed on 76 murderers. The study suggests a significant correlation between apparently motiveless crime and EEG abnormality.

*Ahmed Okasha,  
Psychiatric Unit,  
Ain Shams University,  
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**Brom-Ergocryptine in the Treatment of Phenothiazine-Induced Galactorrhoea.** By P. BEUMONT, J. BRÜWER, B. PIMSTONE, A. VINIK and W. UTIAN.

Nine female psychiatric patients, all of whom were receiving phenothiazine medication, and who showed evidence of inappropriate breast secretion, were given a course of brom-ergocryptine. Plasma prolactin levels fell and the galactorrhoea became less severe. There were no discernible effects on plasma LH and FSH, but one patient who had previously been amenorrhoeic resumed menstruation.

*P. Beaumont,  
Department of Psychiatry,  
Groote Schuur Hospital,  
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South Africa.*

**Short-term Psychiatric Sequelae to Therapeutic Termination of Pregnancy.** By BRIAN LASK.

A prospective study of the short-term psychiatric sequelae to therapeutic termination of pregnancy is described. Fifty women admitted for termination were interviewed on the day before operation, and 44 of these were interviewed 6 months after operation.

The outcome was favourable in 30 (68 per cent) and unfavourable in 14 cases (32 per cent). The psychiatric status of 39 patients was improved or unchanged (89 per cent), and only 7 (16 per cent) regretted the termination. Adverse sequelae included feelings of loss, guilt, regret and self-reproach, varying from mild to severe. When moderate or severe, these were usually associated with depressive states, which themselves varied in intensity from mild to sufficiently severe to necessitate hospital admission. It is argued that in only four cases could the unfavourable outcome be related directly to the termination rather than to the environment, and that even in these cases there is no indication that the patient would have done any better if the pregnancy had been allowed to continue.

*Bryan Lask,  
Department of Psychological Medicine,  
The Hospital for Sick Children,  
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London, W.C.1.*

**The Marke-Nyman Temperament Scale in Depression.** By MARYSE METCALFE, ANTHONY L. JOHNSON and ALEC COPPEN.

Distributions of the scores on the three dimensions of personality (Validity, Solidity and Stability) measured by the Marke-Nyman Temperament Scale (MNTS) were obtained from 163 recovered unipolar depressed patients and 208 controls. Validity and Solidity were significantly lower and higher, respectively, in the recovered depressives, suggesting that they were lacking in self-confidence, energy and adaptability. An item analysis of the MNTS, seeking those items which best differentiated controls from recovered depressives confirmed this result.

*Alec Coppen,  
MRC Neuropsychiatry Unit,  
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West Park Hospital,  
Epsom, Surrey.*

**'Suicidal Behaviour' in New South Wales.** By J. KRAUS.

In a study of 17,605 suicidal acts recorded in New South Wales during a six-year period, chronological age was found to be correlated negatively with rates of such acts and positively with their fatal outcome.

Age was also positively correlated with change of means used in suicide attempts, from soporifics and analgesics to 'active' and violent methods. There were significant differences between males and females in the use of various means, but analgesic and soporific substances were used most often by both. It was argued that the findings confirm that 'suicidal behaviour' is a continuous variable and indicate a changing reaction to stress with increasing age.

*J. Kraus,  
Department of Youth and Community Services,  
Sydney, N.S.W. 2000,  
Australia.*

**Group Greed and Group Need—An Occupational Hazard for Psychiatric Personnel?**

By B. B. ZEITLYN.

This preliminary communication draws attention to a condition that may adversely affect psychiatric personnel, and to some of its determinants. Those working in institutions where meetings are a major occupational activity appear especially at risk. Idealization of groups and their activities lead to a craving to join them and to dependency reactions once membership is achieved. The aetiology, symptomatology and treatment are discussed; prognosis is usually benign.

*B. B. Zeitlyn,  
Addenbrooke's Hospital,  
Cambridge.*

**Helping the Chronic Psychiatric Patient in an Industrial Therapy Setting: an experiment in inter-disciplinary co-operation.** By ANNE PATTIE, ANNE WILLIAMS and DAVID EMERY.

A study was carried out by psychological, nursing and industrial therapy staff to assess the effects of providing a more varied and stimulating day for deteriorated patients attending an Industrial Therapy Unit. Scales were devised to measure improvement in general functioning. These suggest that the patients responded to the activities provided, and the additional effect of 'mothering' offered to one of the experimental groups produced some extra benefit. It is shown that initial work ability is a poor indicator of capacity for progress, and improvement occurs more in relation to the first assessment by the psychological and nursing staff. The use of these scales is evaluated and the value of research in a clinical setting discussed.

*Anne H. Pattie,  
Clifton Hospital,  
York.*

## Book Reviews

HENRI EY

**Traité des Hallucinations.** By HENRI EY. Paris: Masson. 1973. Pp. xx+1533. Price 440 Fr.

Forty years ago a slim little book was published with the title *Hallucinations et Délire*. It was launched with a prophetic foreword by Professor Séglas, who commended its clarity and original standpoint: 'This is not a beginner's essay (he wrote); the author has already attracted favourable attention by a series of papers on hallucinations—a subject which seems to interest him passionately. The book is surely the first of a series; we wait impatiently for more. Beneath its modest exterior this little book is destined to be a recognized classic.' All this has come true; the promising young pupil of Claude and de Clérambault is now an authoritative leader of French psychiatry, vastly learned, a prolific author, a severe and outspoken critic.

In the two massive volumes of *Traité des Hallucinations* Ey has put on paper the fruits of a lifetime of concentrated study and clinical experience. His reading is very wide, chiefly in French, of course, and in German. He has added to it by introducing a number of terms which he has devised or has borrowed from phenomenology, e.g. 'éidolies hallucinosiques', phantéidolies, protéidolies, 'facticity of hallucinations', 'modèle linéaire'. There are semantic pitfalls for the unwary in such words as *délire* (which in the French usage does not signify a state of disturbed consciousness). Dr. Ey deals fully with the complicated verbal and theoretical issues raised and assists the reader with copious footnotes, indexes and a glossary of technical and foreign terms.

In his elaborate and penetrating exposition Ey poses many of the crucial questions of psychiatry. While retaining full control of the central argument, he faces its diverse theoretical and clinical problems with unwearied thoroughness. In the opening words of the treatise he records that from his very first contact with psychiatry he was fascinated by hallucinations—'a mystery through which the miracle of perception is made visible'; it constitutes the keystone of psychopathology, all the questions of psychiatry fall into place in their relation to it. He rejects in bitter words the betrayal of psychiatry by those who profess to advance it while preaching 'anti-psychiatry'; 'this book sets out to delimit sharply the contours of a psychiatric fact—the hallucination—exorcising at

once both brain mythology and the myths of the Unconscious... Psychiatry cannot afford to indulge in verbal reveries, improvised ideas or scrappy knowledge'.

Four main ideas run through the *Traité*. The first of these asserts that an hallucination is a pathological phenomenon, of heterogeneous structure (anomie), in contrast to illusions, which normally enter the field of action of perceptual systems to some extent in everybody (but particularly in children and members of social groups prone to magical thinking). The second theme is that the hallucination is at every level irreducible to the traditional mechanistic interpretation which regards it as an effect of neuro-sensory excitation. The third maintains that hallucinations are not the outcome of psychogenesis, as in the psychoanalytic formulation; there must be another dimension, arising from a defect or breach of reality. The fourth maintains that hallucinations divide according to the level of mental disorganization into 'Hallucinations délirantes' and 'Éidolies hallucinosiques'.

The book begins with a review of the definition and historical development of the concept of hallucination. The mechanical model favoured by neuro-physiologists is rejected; an hierarchical model is preferred. The hallucination is not an elementary, primitive phenomenon but the resultant of an essentially negative pathological condition: due regard is paid to the seminal views of Hughlings Jackson.

The perceptual disturbances of vision receive lengthy consideration from the clinical standpoint; they are followed by discussion of auditory, tactile, olfactory and somatic (including depersonalization) hallucinations.

A chapter is then devoted to hallucinations as they present themselves in cerebral affections (especially alcoholic encephalopathy, neurosyphilis, encephalitis lethargica, cerebral tumour, trauma, and vascular lesions).

The remaining two hundred pages of Book I constitute a monograph on the action of hallucinogenic drugs and of sensory isolation. The opening chapters of the second volume deal with hallucinations in the acute psychoses, chronic delusional psychoses, and obsessional neurosis. This gives occasion for a highly sophisticated review of the French

formulation of paranoid and paranoiac conditions. The place of hallucinations in hysteria is also duly examined; 'hallucinations and depression constantly appear as clinical manifestations of hysteria, but in the imaginary factitious world of the hysteric delusions and hallucinations are themselves falsified phenomena. The hallucination of the hysteric does not put an object where there is none, it puts objects without reality in a world operating on the pleasure principle'.

The greater part of the rest of the book is taken up with theory—often abstruse theory. There are, Ey holds, two fundamental models of a theory of hallucination, which he calls 'linear' and 'architectonic'. The linear model is 'mechanical' or 'psycho-genic'. He considers these models faulty in that they reduce the hallucination to a simple positive phenomenon—stimulation of sensory centres or affective thrust. The organo-dynamic model instead goes to the root of all the modalities of hallucination. As a phenomenon contravening the order and regularity of our mental organization the hallucination makes us perceive when a false object is being put forward.

The final four chapters of the book contain a restrained account of the methods of treatment commonly employed on schizophrenic and other patients in whom hallucinations may be a prominent feature.

This treatise is a monument of learning and critical exposition. It opens the door to a whole corpus of French psychiatry which is little known to English or American readers (though in reverse Dr. Ey shows himself to be intimately acquainted with German, English and American literature). However, working one's way through it is heavy going, partly because there is much repetition, still more because of the unfamiliarity of the modes of thought and language in which it is couched.

AUBREY LEWIS.

### CHILDHOOD PSYCHOSIS

**Childhood Psychosis: Initial Studies and New Insights.** By LEO KANNER. Chichester: John Wiley and Sons for V. H. Winston. 1973. Pp. vii+283. Price £5.50.

This book could equally well be entitled 'Childhood Psychosis Revisited', the main theme being that there is little new in infantile autism apart from the development of more sophisticated instruments with more powerful lenses for focussing upon the old issues. Such critical hyperbole is, of course, a tribute to Kanner and attests to the way the old master combined creative thinking with accurate recording of clinical data in such a way as to sharpen and magnify perception of an area of childhood problems

hitherto dim and hazy. He perceived harmonies where none had been perceived before and offered theories (only some of which, as is to be expected, stood the test of time) to explain the observed facts. Such theories and facts generated thoughtful and provocative hypotheses, many of which today still constitute the basis of major research.

Rereading all these essays in one book is a salutary experience, as it reminds us that it was in the 1940s that Kanner discussed the relationship between autism and dysphasia, and between autism and the psychoses occurring in later childhood (of a schizophrenic variety), and made the observation that autistic children never developed hallucinations or delusions. And it was in the mid-1950s that he took the first tentative (but often unheeded) step in evaluation when he pointed out that none of the various treatments employed had any noticeable effect, and at this time that he provided prognostic pointers such as that the absence of language in pre-school children serves as a criterion of severity of the autistic process. In addition, one becomes appreciative of the way in which Kanner has combined a mastery of the clinical anecdote with penetrating insights so that the book is not only rich in information but also eminently readable.

His final chapter provides a previously unpublished descriptive account of the course of the disorder in terms of a follow-up of 34 psychotic children. Indeed, the last few chapters provide fascinating new findings still presented in his clear and distinctive style, so that the book is not only a reprint of the old but reveals that he has not lost his touch in providing an account of the new.

This book is essential reading for those professionally committed to child psychiatry and child psychology. But general psychiatrists, too, will find here a lucid and absorbing account of how impressively accurate clinical observation and analysis followed by synthesis of the essential elements has led to the delineation and development of our knowledge of the syndrome of infantile autism.

ISRAEL KOLVIN and DONALD McI. SCOTT.

### ALIMENTARY DISORDERS

**Eating Disorders: Obesity, Anorexia Nervosa and the Person Within.** By HILDE BRUCH. Routledge and Kegan Paul. 1974. Pp. x+396. Index pp. 8. Price £3.95.

Hilde Bruch is an American psychiatrist who has made a unique contribution to the study of the emotional aspects of the eating disorders, spanning over 35 years. This book presents an account of the continuing development of her ideas over this period. Her present central position is that the feeding dis-

orders have their roots in faulty interactions between a child and its parents. If the parents respond inappropriately to a child's signals and needs, fail to distinguish between expressions of hunger and other needs, and use food as a universal pacifier, the child fails to develop the capacity to differentiate between various needs, feeling helpless in controlling his biological urges and emotional impulses. He thus grows up without a sense of owning his own body, begins to feel that he is controlled by others and remains unaware of his own personality, and the intake of food becomes subjected to his emotional experiences. This is, of course, an over-simplification of her current views, which are presented in all their complexity with an admirable clarity.

The book contains an abundance of information about the psychological aspects of the feeding disorders and is richly illustrated by detailed case histories of patients studied and treated over many years, each fully documenting the author's own psychotherapeutic techniques.

This is an important book which can be highly recommended to all psychiatrists and psychologists interested in this area, as it will clearly retain a central place in literature for many years. It is, in addition, extremely readable, and, for a book of its kind, is modestly priced.

A. WAKELING.

### PSYCHODYNAMICS

#### **The Experimental Study of Freudian Theories.**

By H. J. EYSENCK and G. D. WILSON. London: Methuen and Co. Ltd. 1973. Pp. 405. Price £4.90.

The editors reprint 21 articles, falling into two classes. One type presents experimental attempts to validate psychoanalytic theories. Yarrow on thumb-sucking, Goldman Eisler on the oral personality, Blum and Miller on the same topic and Kline on obsessiveness are among the investigators who aim to test Freudian beliefs.

Articles of another kind are interspersed, which start from the opposite direction. Eysenck and Souciff lead into their paper with the statement that 'for reasons unknown to us the theory of sexual symbolism is ascribed to Freud', and they then disprove that men prefer round shapes and women elongated shapes. A paper by Eysenck (alone) demonstrates that psychotherapy is ineffective. Wolpe and Rachman re-analyse *Little Hans* to show that much psychoanalytic reasoning is spurious.

Brief comments by the editors follow each article, highly critical of the first type of article and correspondingly approving of the second. Psychoanalysis is shown as lacking in predictive power, its 'vital tenets'

unconfirmed, and its treatment value negligible. The urgent need is for a new approach. This, the editors inform us, is indeed available: it is behaviour therapy.

'So geographers, in Afric-maps,  
With savage pictures fill their gaps;  
And o'er uninhabitable downs  
Place elephants for want of towns'.

To convey fully the superiority of their alternative approach 'would require another volume'. The present book is a demolition exercise; the editors single out faults 'nothing short of disastrous to the logic of the experiment', and in another article 'an astonishing flaw in the methodology' which could be overlooked only if the editors were 'charitable or imperceptive enough'.

For each explanation proposed in the first group of articles the editors advance 'alternative theoretical positions'. So doing, they do not deny themselves italics: 'It may be that women want a penis *in* them, not *on* them'. Indeed, they suggest that feminists might regard a penis as 'a dreadful cancerous protuberance in their crutch'. On p. 96 the word 'oral' is wrongly printed for 'anal', and this error diminishes the effect the authors intend, as they taunt Kline ('whom we regard as fairly uncritical') for the conclusions he drew about obsessional personality disorder. Kline administered the Blacky Pictures test of Blum and the editors deride him for the conclusions he drew from subjects' attitudes to 'shitting dogs', which they do not accept.

Goldman-Eisler, from the editors' own department, is spared derision, but they reject her psychoanalytic explanation for pessimism in those weaned early—a more parsimonious hereditary explanation is offered instead: neurotic introversion. Calvin Hall, exploring dreams, concluded that a male stranger often represents the dreamer's fantasy as a child that his father was a hostile stranger. In dismissing this, the editors point to 'an existing theory of dream interpretation developed by Eysenck (1957)'.

Freud is censured as profoundly unoriginal; he 'simply took over existing knowledge without acknowledgement'. Zamansky's study of paranoia and homosexuality is an occasion for seeing if 'Freud has at last been found to have made a genuine contribution to modern psychology'.

Readers of this book will thank Professor Eysenck and Dr. Wilson for making some of these papers easily accessible, even if their glee over their hatchet job fails to please. From their performance, readers would not suppose that detachment is also part of the 'critical habits of evaluation' which the editors explain they want to engender in the young.

The editors succeed in showing that many experiments to test psychoanalytic theory lack sensible hypotheses or rigorous methodology; that excessively hostile animus in a critic damages his own case; and that the search is still on for a convincing alternative theory or method of psychotherapy.

H. J. WALTON.

**Minutes of the Vienna Psychoanalytic Society, Volume III: 1910-11.** Edited by HERMAN NUNBERG and ERNEST FEDERN. Translated by M. NUNBERG with the assistance of H. COLLINS. New York: International Universities Press, Inc. 1974. Pp. 367. Price \$20.00.

These Minutes, like those of the first and second volumes, are a must for the study of the history of the psychoanalytic movement. Unfortunately the high price may mean that only affluent enthusiasts will be able to buy it.

The charm is that, apart from a prepared paper, the participants came out with extempore opinions, interpretations and criticisms, and so differences and contradictions are thus exposed in accordance with the differing personalities. The foreword to this book is surely unfair in hinting that members of the society plotted to minimize Freud's achievements. After all, to use fashionable phraseology, Freud suffered somewhat from the Cult of Personality and did not take kindly to 'revisionists' and 'deviationists'. It is therefore not surprising to learn that Stekel resigned his post of deputy chairman and Adler that of chairman, and both finally ceased to be members. Freud was then elected chairman and he claimed a right to limit the time each discussant might speak, but Sadger managed to obtain for speakers the right to make the concluding remarks. Altogether one comes to the conclusion that human beings are unique and therefore harbour unique ideologies. It is hardly fair to quote statements out of context, but the reviewer liked Tausk beginning the meeting of 12 October 1910 with, 'I was not able to learn anything new from the presentation', and Freud (22 March 1911) 'considers it very difficult in principle to draw any sort of conclusions from a therapeutic effect'.

I. ATKIN.

#### FORENSIC

**Criminal Behaviour.** By HERSCHEL PRINS. London: Pitman. 1973. Pp. xii+245. Price £2.50, paperback £1.50.

This book is attractively produced, written in a clear fashion, and fulfils its purpose in being a concise introductory text. It is well documented, to the point of being painstaking. Perhaps some of the more time-

honoured detail could have been omitted to give space for fresher material. For example, one finds it difficult to forgive the author for his dismissal of group methods of treatment and the therapeutic community in one sentence, when he finds room for matters of less consequence.

There are four sections: (1) Defining and measuring crime; (2) Towards an understanding of crime; (3) Methods of disposal; and (4) The effectiveness of the penal system. Part 3 comprises the main part of the text and is the most useful. The book is probably too superficial for the psychiatrist or psychologist experienced in the field, but could be warmly recommended to anyone beginning the study of the subject. It offers a bird's-eye view for the new entrant to forensic psychiatry.

J. K. W. MORRICE.

**Paroled but not Free. Ex-Offenders Look at What They Need to Make it Outside.** Edited by ROSEMARY J. ERICKSON, WAYMAN J. CROW, LOUIS A. ZURCHER and ARCHIE V. CONNETT. New York: Behavioral Publications. 1973. Pp. xiii+125. Index 4 pp. Price \$9.95 hardbound, \$4.95 paperback.

Parole, a system whereby prisoners are discharged from custody in advance of their expected date of release, subject to certain conditions, is relatively new in Britain, but has been a feature of the penal system in the U.S.A. for many years. Reports as to how the system has succeeded or failed have emanated from that country in plenty. But accounts of what may be termed 'consumer research', or how the system meets the needs of the released prisoners rather than of the society into which he is discharged, are few.

This book, then, is concerned with just this aspect of the penal process. Methodologically speaking, a unique feature is in the employment of a variant of the old proverb: 'Set a thief to catch a thief'; a specially trained group of six ex-felons was used to interview in depth sixty parolees in San Diego County, California.

It is quite obvious that the parole system falls far short of the minimum needs of parolees in terms of food, shelter, clothing and work. The irony, the report is at pains to point out, is that approximately \$3,500 a year is spent to keep a man in prison; yet he is released with less than \$50 in his pocket and expected to succeed. This may be one of the reasons for the high failure rate, as high indeed as 50 per cent of those paroled. More important, however, is that so often the wants and expectations of parolees exceed the means of getting them in terms of their skills, intelligence, education, social stability and personality structure. Not surprisingly, perhaps, they

again resort to crime in order to achieve their goals.

Although this is a useful book for all those concerned with the rehabilitation of prisoners, the English reader who speaks the 'Queen's English' is at a disadvantage. All sub-cultures have their own patois, and the American criminal sub-culture is no exception. It might have been useful, therefore, to provide a glossary to explain such words as, 'cons', 'squares', 'joint', 'rotgut', 'dudes', etc. etc. Similarly, but at a different level, it might have been advantageous to have had an English editor or translator. 'The felon has a high probability of rarely having experienced a sense of belongingness in an acceptable social world', is to English ears a cumbersome way of saying that criminals often come from a criminal background. At least that is what I think is meant.

HENRY R. ROLLIN.

#### GENERAL PRACTICE

**Six Minutes for the Patient: Interactions in General Practice Consultation.** Edited by ENID BALINT and J. S. NORELL. London: Tavistock Publications. 1973. Pp. xxi+177. Index 4 pp. Price £2.25.

This book consists of contributions by Enid and the late Michael Balint and some of a group of general practitioners they had worked with over a period of several years. It deals with the interesting and important question of how to make the most effective use of the ordinary G.P. consultation.

The inappropriateness of 'illness-centred' medicine to most of the general practitioner's work is stressed. One of the alternatives had seemed to be the exploratory process which enabled the doctor to understand his patient better as a person, in his social context, his family, and in the doctor-patient relationship. Although this often led to the doctor feeling more satisfied that he had reached an 'overall diagnosis', the value of this somewhat time-consuming process is questioned, and here the authors examine what therapeutic work can be done in the routine brief interview.

Instead of following preconceived notions of what is wrong, or searching for 'causes', they feel that the doctor should allow himself to observe sensitively and to respond to what the patient may be conveying, or trying to convey, in the 'here and now'. This fine tuning-in may lead to what is termed a 'flash', which is a brief, intense, mutual awareness of something important to the patient, which, it is suggested, can transform a case, producing a powerful therapeutic effect.

There is an impressive attempt to study this effect in a rigorous or 'scientific' way by the use of forms for recording data from initial and follow-up inter-

views, making predictions, and checking outcome. As seems often the case, these may have affected the style or perceptions of the doctors, but add little to the main clinical and theoretical points.

The book raises a number of issues regarding the mechanism and therapeutic action of the interview which are of general interest. For example, the suggestion is made that the pre-condition for a 'flash' is a far-reaching identification with the patient, though this is not at all evident in many of the examples quoted. Questions remain, too, about the doctor's capacity and willingness to use this approach, its limitations, and the risks of the doctor (or the patient) being temporarily blinded by the 'flash'. While there is some recognition of these difficulties, further discussion would have been welcome.

There is inevitably some variation in quality and overlap in a book written by different members of one working group, but this is a stimulating account of work which has great relevance to general practice, and beyond.

M. FELDMAN.

#### COMMUNITY PSYCHIATRY

**The Organization and Delivery of Mental Health Services in the Ghetto: The Lincoln Hospital Experience.** By SEYMOUR R. KAPLAN and MELVIN ROMAN. New York: Praeger. 1973. Pp. xxviii+306. Index 9 pp. Price \$19.50.

'A computer program . . . was developed which compiled a statistical cross-referencing of the informing, a cumulative record of all the clients, and the distribution by areas . . . kept on magnetic tape so that it was available for a statistical analysis of all the clients to date at any time.' How admirable, one thinks; just what this DGH. unit needs. But just a minute! 'The South Bronx is a blighted glum area. There are vast sections of abandoned housing; debris clutters the streets. The extent of crime, violence and physical decay staggers the imagination'. Also, it appears, there was only one dilapidated general hospital of 300 beds (none of them psychiatric) for a population of 350,000. Perhaps a locally available comprehensive service for severe psychosis would have been worth a good many miles of magnetic tape.

In fact, this book illustrates very well the basic failures both of psychiatry and of medico-social services generally in America. It records the attempt to set up in this unfortunate area of New York a community-based mental health service, related to the economic and ethnic backgrounds of the residents, and at least partly staffed by them. After winning a silver award from the APA in 1968, it virtually collapsed in a maelstrom of conflict the following year, and afterwards little seems to have been left

of the original conception. It is illustrated by charts of 'structural relationships' of related institutions which suggest a piece of irretrievably dropped knitting. A great deal of money went into the experiment, but most of it drained away into the familiar consultants, evaluations and training programmes, rather than into actually treating patients. Up to the end, the innumerable bureaucracies and funding agencies were still locked in self-destructive struggles of Byzantine complexity. The mentally ill of South Bronx, meanwhile, were no better off, but that's how the cookie crumbles.

HUGH FREEMAN.

### ADOLESCENCE

#### **Normal Adolescence: Its Dynamics and Impact.**

By THE COMMITTEE ON ADOLESCENCE, GROUP FOR THE ADVANCEMENT OF PSYCHIATRY. London: Crosby Lockwood Staples (Granada Publishing Ltd.). 1974. Pp. 121. Index 6 pp. Price £1.50 (paperback), £3.00 (hardback).

This is a sympathetic and sensible account of adolescence; brief, concise and illuminating. The authors have reconciled readability with a mainly successful attempt to integrate psychoanalytic theory and ideas taken from sociology, anthropology and social psychology. Though the bias is still towards the understanding of the individual adolescence is seen in the context of society, and although the society to which most reference is made is North American there is little that will puzzle an English reader. There is a useful bibliography, though the sources of statements made in the text are not cited specifically and references to survey work are not included. The least satisfactory section is that on adult responses to adolescence, which omits any discussion of the remarkable responses the appointed agents of adult society make to adolescents in schools, employment and further education.

On the whole, the book can be warmly recommended. Whatever one's concern, whether teaching, treating, living with or being an adolescent, this book is likely to be helpful and useful. It is a pity the publishers did not have the courage to aim at a larger edition and a lower price.

A. J. COSTELLO.

### FEAR AND ANXIETY

#### **The Meanings of Fear.** By STANLEY RACHMAN.

Harmondsworth: Penguin Education, Penguin Books Ltd. Pp. 119. Price 45p.

Dr. Rachman's contribution to the fast-growing literature on fears and phobias is a succinct, clearly written little book, which is apparently aimed at the intelligent layman or the not-too-serious student of

psychology. However, despite its brevity, it contains all the important information on the subject, and the conclusions that the author reaches, without always giving chapter and verse, are very sound and would be agreed by almost all workers in the field. We have moved away from the naive Wolpeian idea that all phobias are in the nature of learned responses to an original traumatic event. Rachman deals with the definition, physiology and measurement of fear, the expression and recognition of it, the existence of innate fears, individual differences, methods of fear reduction, explanations of the origins of fear, and a discussion of its adaptive value. The author leads towards a behavioural concept of fear, and pokes fashionable fun at the Freudians' colourful hypotheses on the origins of spider and snake phobias. However, he comes down to a balanced viewpoint at the end of the chapter: 'Fears are not always exactly as they seem, but contrary to psychoanalytic beliefs it is unwise to assume that fears are *never* as they seem'. This excellent little book should be very useful to a wide variety of readers.

M. J. CROWE.

#### **Anxiety Factors in Comprehensive Patient**

Care. Edited by W. LINFORD REES. London and Amsterdam: Excerpta Medica. 1973. Pp. 106. Index 7pp. No price stated.

Despite the generous share of discussion which anxiety and anxiety states have had over many years, this book extends the horizon well beyond the usual psychiatric range. It comprises the proceedings of a symposium held last year at which eight contributors discussed anxiety in relation to its presentation in major areas of medical practice.

The chairman, Professor Linford Rees, introduces the subject with a comprehensive review of the whole field, and this is followed by the specialized contributions, in each of which the subject is discussed briefly and pointedly. Professor Groen explains the advances in neurophysiology and psychosomatic medicine and the effects of pharmacological treatment and psychotherapy, giving rational and practical advice on effective treatment methods for anxiety in systemic disorders. Professor Hamilton deals with the clinical interrelationships between anxiety and depressive states and considers the treatment and management in practical terms.

In 'Anxiety in General Practice', Dr. Beusekom neatly turns the focus of his paper from the anxious patient to the anxious doctor, uncovering the universal and partly submerged fears of doctors in clinical relationships. Two groups of patients have suffered most in the changes in sexual mores over recent decades according to Dr. de Buck, whose



theme is mainly impotence and frigidity and the many approaches in treatment. Dr. Meltzer explains the relationships between anxiety and cardiac disease, emphasizing the important place of anxiety in differential diagnosis, the effects of anxiety on existing organic disorders, the aetiological role of anxiety in coronary disease and its contribution to cardiac invalidism. The anxiety-pain link is considered in depth by Dr. Bruyn who gives a clear account of the complex neuro-anatomical pathways involved, their physiology and clinical significance.

Several aspects of emotional disturbance seen in gynaecological practice are covered by Drs. Mann and Cuellar, who also stress the postgraduate training implications.

In addition to the valuable factual content, these proceedings fill a mind-stretching role and give substance in practical terms to the message of the whole review towards improving the quality of patient care in all fields of medicine. The sub-title 'Where general medicine and psychiatry meet' invites a wide readership, whose members will be well rewarded.

JOHN POLLITT.

#### MISCELLANEOUS

**The Cannabis Experience.** By JOSEPH BERKE and CALVIN C. HERNTON. London: Peter Owen. 1974. Pp. 288. Price £4.50.

This book is sub-titled 'An Interpretive Study of the Effects of Marihuana and Hashish', and this is a good description of findings selected by authors who appear worthy, earnest, humourless and unscientific, but believers. There is an attractive Norman Vincent Peale innocence to their enthusiasm about the inherent goodness of cannabis. The book is very long, or perhaps it seems long because it consists of a mass of short subjective descriptions of the effects of cannabis use from replies to a questionnaire. This was circulated anonymously to people the authors knew who smoked cannabis and who knew others who in turn knew others, and the questionnaires were also distributed through various London bookshops, pubs, cafes and clubs that catered for 'heads'. Altogether 1,600 questionnaires were circulated; 534 were returned and 522 analysed. It is not clear at whom this book is aimed, since there will be little new in it for the converted and it will be unconvincing to the unconverted. But I suppose that books of this type are essentially to provide comfort and sustenance

for the flock rather than to convert the unbeliever. When the authors state 'in general pot exerts a liberating influence on the body . . . users employ adjectives like "good", "better", "great", "free" and "alive" to describe how they experience their body and all its functions once they turn on', I could not help thinking that other mentors would advise them to open their souls to God in order to experience being 'good', 'better', 'great', 'free' and 'alive'. Definitely for the inspirational rather than the scientific end of the bookshelf.

THOMAS BEWLEY.

**Politics, Medicine and Social Science.** By DAVID MECHANIC. Chichester: John Wiley and Sons. 1974. Pp. x+306. Index 13 pp. Price £7.30.

This book covers major items in the provision of health care ranging from broad national contexts to the organization of primary and hospital care and to aspects of individual illness behaviour. Many references to the author's studies of the British Health Service as well as of those of several other countries help to make the book of more than purely American relevance. Of particular interest are the discussions of the need for changes in the roles of doctors and of the various resistances to such changes.

This is Professor Mechanic's second book of collected papers in two years. It is characteristically intelligent, lucid and practical; it makes important points and gives new insights into illness behaviour, medical practice and health care systems. Yet, like its predecessor, it suffers from the drawbacks, repetitions and lack of cohesion that betray its origins; somewhere inside these two substantial works a slim volume is trying to get out.

RICHARD MAYOU.

**The Functions of Sleep.** By E. L. HARTMANN. London: Yale University Press. 1974. Pp. 198. Price £3.50 (cloth), £1.25 (paper).

This is an easily read account of sleep, including past theories and the author's own ideas. I found particularly interesting his finding of positive association between the length of REM sleep and the patient's personality—worrying introverted personalities sleeping more hours, the extra time being due to increased REM sleep. The other chapters are extremely sketchy, however, and in general this is a book much more for the lay public than for psychiatrists.

C. M. B. PARE.

## Books Received

### PSYCHIATRY, PSYCHOANALYSIS AND PSYCHOLOGY

- Themes and Variations in European Psychiatry—An Anthology.** Edited by S. R. HIRSCH and M. SHEPHERD. *John Wright and Sons.* Price £6.50.
- Psychological Measurements in Psychopharmacology.** Edited by P. PICHOT and R. OLIVIER-MARTIN. *S. Karger.* Price £14.30.
- Comparative Psychiatry: a Theoretical Framework.** By P. M. YAP. Edited by M. P. LAU and A. B. STOKES. *University of Toronto Press for the Clarke Institute of Psychiatry.* Price £4.80.
- Problems of Psychiatric Leadership—formulated by The Council on Therapy. Group for the Advancement of Psychiatry Report No. 90.** Price \$1.00.
- Not Made of Wood—A Psychiatrist Discovers his own Profession.** By J. FODRAINE. *Quartet Books.* Price £3.95.
- The Privacy of the Self.** By M. M. R. KHAN. *Hogarth Press and the Institute of Psycho-Analysis.* Price £5.00.
- Technique in Jungian Analysis—The Library of Analytical Psychology, Volume 2.** Edited by M. FORDHAM, R. GORDON, J. HUBBACK and K. LAMBERT. *William Heinemann Medical Books.* Price £4.50.
- Introduction to Group Treatments in Psychiatry.** By P. B. DE MARÉ and L. C. KREEGER. *Butterworth.* Price £1.10.

### CHILDREN AND ADOLESCENTS

- Children in Conflict: A Casebook.** By A. DAVIDS. *John Wiley.* Price £5.80, £2.60 (paperback).
- Clinical Child Psychology. Current Practices and Future Perspectives.** By G. J. WILLIAMS and S. GORDON. *Behavioral Publications.* Price \$19.95.
- Mental Health Intervention in the Primary Grades.** By A. MARMORALE and F. BROWN. *Behavioral Publications.* Price \$3.95 (paperback).
- Runaway House—A Youth-Run Service Project.** By DODIE BUTLER, J. REINER and B. TREANOR. *National Institute of Mental Health.* Free distribution.
- Doris—The Story of a Disfigured Deaf Child.** By A. R. BODENHEIMER. Translated by H. A. BASILIUS. *Wayne State University Press.* Price \$8.95.

### BEHAVIOUR

- Obsessional States.** Edited by H. R. BEECH. *Methuen.* Price £5.00.
- Motivation and Achievement.** By J. W. ATKINSON and J. O. EAYNOR. *John Wiley.* Price £10.60.
- Psychodrama: Theory and Practice.** Edited by I. A. GREENBERG. *Behavioral Publications.* Price \$16.95.
- Dictionary of Behavioral Sciences.** Compiled and edited by B. J. WOLMAN. *Macmillan.* Price £5.95.

- A Triune Concept of the Brain and Behaviour.** By P. D. MACLEAN. The Clarence M. Hincks Memorial Lecture 1969. *University of Toronto Press.* Price £4.60.

### SEXOLOGY

- The Male Dilemma—How to Survive the Sexual Revolution.** By A. STEINMANN and D. J. FOX. *Jason Aronson.* Price \$12.50.
- Being Different: the Autobiography of Jane Fry.** Edited by R. BOGDAN. *John Wiley.* Price £4.50.

### SCHIZOPHRENIA AND DEPRESSION

- Catatonia.** By K. L. KAHLBAUM. *John Wiley for John Hopkins University Press.* Price £4.70.
- Depression: Theory and Research.** By J. BECKER. *John Wiley.* Price £6.65.

### COMMUNITY, SOCIAL AND ALLIED MATTERS

- Parents and Family Planning Services.** By ANN CARTWRIGHT—Report of the Institute of Community Studies. *Routledge and Kegan Paul.* Price £1.25.
- Loss and Change.** By P. MARRIS. Reports of the Institute of Community Studies. *Routledge and Kegan Paul.* Price £3.50.
- Statistics for the Social Sciences.** By W. L. HAYS, 2nd edition. *Holt, Rinehart and Winston.* Price £4.50.
- The Therapeutic Community—A Sourcebook of Readings.** Edited by J. J. ROSSI and W. J. FILSTEAD. *Behavioral Publications.* Price \$16.95.
- Support Systems and Community Mental Health—Lectures on Concept Development.** By G. CAPLAN. *Behavioral Publications.* No price stated.
- Continuing Education in Mental Health—Project Summaries** edited by Staff of Continuing Education Branch Division of Manpower and Training Programs. *National Institute of Mental Health.* Free distribution.

### DRUGS AND DRUG ADDICTION

- Therapeutic Effectiveness of Methadone Maintenance Programs in the Management of Drug Dependence of Morphine Type in the U.S.A.** By S. S. WILMARTH and A. GOLDSTEIN. *World Health Organization.* Price Sw. Fr. 17.

### MISCELLANEOUS

- Fire and Fire-Raisers.** By D. SCOTT. *Duckworth.* Price £3.45.
- A Psychiatric Study of Myths and Fairy Tales—Their Origin, Meaning and Usefulness.** By J. E. HENSCHER. 2nd edition. *Charles C. Thomas.* Price \$14.95.

Many of these books will be reviewed at a later date.

## Correspondence

*Letters for publication in the Correspondence columns should be addressed to:*

The Editor, British Journal of Psychiatry, Chandos House, 2 Queen Anne Street, London, W1M 9LE

### EFFECTS OF HYPNOTICS ON ANXIOUS PATIENTS

DEAR SIR,

We read with interest the paper by Dr. Malpas and her colleagues in the May 1974 issue (124, 482-4) on the effect of hypnotics on anxious patients. We cannot accept unchallenged some of the points in the discussion.

Comparing the effects of a single dose of an hypnotic drug on young well subjects with the effects of multiple doses of the same hypnotic on older anxious subjects does not settle the argument whether the behavioural effect of hypnotic drugs in anxious subjects is different from that in normals. It is possible that had Dr. Malpas and her colleagues tested normal subjects at the end of a week's ingestion of the hypnotic they might also have adapted to its effects by then, so that there would have been little noticeable effect on behavioural or EEG testing compared with effects obtained by testing after a single dose.

In a new series of experiments on the effects of psychotropic drugs on driving performance, which we are about to start, we hope to test whether such adaptation does occur in normal subjects: a weakness of our previous study (Betts *et al.*, 1972) was that the deleterious effects that various psychotropic drugs had on driving performance in normal subjects were measured at the end of five doses only.

Neither we nor Dr. Malpas really know whether the effect of hypnotic and other psychotropic medication on performance tests in normals is the same as in the highly aroused. We suspect that the effect on performance of these drugs in anxious subjects is probably more complex than in normals (as anxiety itself has its own effects on performance, though even in normals effects do depend on personality variables), but we think there is little evidence so far that it is likely to be less. Dr. Malpas and her colleagues would presumably disagree.

If it is true that the effects of psychotropic drugs on performance depend on levels of arousal, then extrapolating from experiments such as ours, using normal subjects, to clinical populations of patients would be

treacherous. We would have liked to have tested performance in anxious patients taking various drugs or placebo on our driving tests: but the ethical and practical difficulties of using a patient population in this way prevented us. These difficulties are immense: if it can be shown that it is important to test behavioural effects of drugs on such a population these difficulties will have to be overcome. We remain to be convinced of this need.

Two further points in Dr. Malpas's study concern us. The first relates to the absence of any comment in her paper on any allowance made for likely carry-over effects between different drug treatments. The second concerns the analysis of data: the application of analysis of variance techniques to data which are apparently non-parametric is inappropriate.

T. A. BETTS.

A. B. CLAYTON.

*University of Birmingham Department of Psychiatry,  
Queen Elizabeth Hospital,  
Edgbaston,  
Birmingham, B15 2TH.*

#### REFERENCE

- BETTS, T. A., CLAYTON, A. B. & MACKAY, G. M. (1972)  
Effects of four commonly used tranquillizers on low  
speed driving performance tests. *British Medical  
Journal*, 4, 580-84.

### MENTAL DISORDER AND SEASON OF BIRTH

DEAR SIR,

In their article (*Journal*, Jan. 1974, 124, 81) Drs. Hare, Price and Slater gave further evidence of an association between season of birth and functional psychosis, revealing a highly significant excess of winter birth among those who develop schizophrenic and manic-depressive illnesses. They stated that they would be interested to know whether such an association existed in other countries, 'especially those with widely different climates or in the southern hemisphere'.

We have recently completed a pilot study which

suggests that a similar trend exists in the more temperate state of New South Wales, Australia.

A random survey of the records of first admissions to a large psychiatric hospital (Callan Park Hospital, Rozelle) was made. Only those who had been born in New South Wales subsequent to 1903, whose full birth date could be determined, and whose diagnosis was recorded on discharge were included, and a sample of 1,488 was obtained.

After correcting for the normal season-of-birth distribution of the general New South Wales population, a trend for schizophrenic and manic patients to show increased winter birth dates and decreased summer birth dates was apparent; this was not noted for other diagnostic groups.

Number of births per month of each diagnostic group was intercorrelated with the mean Sydney temperature for that month. The only diagnostic group to reach significance was schizophrenia ( $r = -0.642$ ; d.f. 11;  $p < 0.05$ ), with mania just failing to do so ( $r = -0.547$ ; d.f. 11,  $p < 0.10$ ).

It is emphasized that this study is a pilot one and that the numbers are insufficient to allow any definite conclusions to be reached. A study is now proceeding, examining data on all first admissions to all psychiatric hospitals in New South Wales from 1970 to 1973.

GORDON PARKER.  
*Lecturer in Psychiatry.*

D. ASHBY, S. DELFENDAHL, P. GOODWIN,  
D. HAMEIRI, S. HICKS, M. O'DONNELL, R. YAP.  
*Fifth Year Medical Students.*

*University of New South Wales,  
The Prince Henry Hospital,  
Little Bay, N.S.W. 2036,  
Australia.*

#### STUDENT HEALTH SERVICES

DEAR SIR,

Dr. Myre Sim in his review of *Student Counselling in Practice* (Journal, May 1974, 124, 502) adopts an extremely proprietorial view of the medical profession's ability to help people (in this instance, students) in emotional or psychological distress.

After three years' experience of running a Student Health Service I would beg to contradict him. It is regrettably my own experience that psychiatrists are often, by their training and the time they can offer, among those least able to provide help for those in psychological distress, unless they are psychotic.

Dr. Sim's suggestion that those psychiatrists who would argue that a medical qualification is irrelevant to the practice of psychiatry should take themselves off the Medical Register is both absurd and irrelevant. However, I would hope that his views in this respect

are idiosyncratic, because the whole tone of his review has, in my opinion, both important and unfortunate implications for the future. He seems to feel that the acquisition of a medical degree and the conferment of Membership of the Royal College of Psychiatrists ordains people to meddle in the minds of others, and that people who have not been so ordained automatically do not have that right. His views are not dissimilar to those of the Roman Catholic Church in the Middle Ages, which was convinced that heretics should be tried by the Court of Inquisition and, if found guilty, should be burned at the stake because they were propagating the works of the devil.

To parody a famous quotation, 'Oh psychiatry, what crimes are committed in thy name'.

JOHN PAYNE.

*Student Health Service,  
London School of Economics and Political Science,  
Houghton Street,  
Aldwych,  
London, WC2A 2AE.*

DEAR SIR,

I will deal with that aspect of Dr. Payne's letter which he emphasizes, namely: 'He (Dr. Sim) seems to feel that the acquisition of a medical degree and the conferment of Membership of the Royal College of Psychiatrists ordains people to meddle in the minds of others, and that people who have not been so ordained automatically do not have that right'.

A medical degree is the result of a prolonged course of study and training directed to give the holder the competence to accept responsibility for his future patients. Membership of the R.C.Psych. is not 'conferred', but is again the result of a prolonged period of training and experience coupled with an examination in psychiatry in all its aspects. Such qualifications do not 'ordain people to meddle'; in fact, the reverse is the case, for the holders are only too aware of the dangers of meddling, and it is this awareness which makes them allergic to the meddling of others.

At the same time, one must recognize that psychotherapy in its many forms has attracted a host of workers who are non-medical, professional and amateurs. Unorthodox and even unqualified practitioners may practise medicine, but it is generally accepted that a sound medical training is an important if not an essential qualification. When it comes to psychiatric treatment people are less scrupulous. Diagnosis is either disregarded or dismissed as irrelevant, and treatment is regarded as the province of anybody who can spare the time. The medical practitioner is immediately dismissed as being too busy, and an army of willing helpers,

including psychologists, social workers, welfare officers, parsons, teachers, marriage guidance counsellors, hypnotists and evangelists have entered the field. They are backed by even greater numbers of enthusiastic amateurs whose need for a person in distress overcomes any inhibitions their lack of training and experience should create.

The public must like that sort of thing or it would not flourish. What we as psychiatrists should be very wary of is that we do not select one group from among them and by association give them an air of medical respectability. I would go further. I would seriously question the practice of taking part in their training, for once 'trained' one has precious little control over them.

Psychiatry has been ridden for years with the practice of the cult, but as doctors we are flexible enough to surrender or modify a useless model for a more useful one. If all psychiatrists had no medical qualifications and were committed entirely to, say, a dynamic model, how would recent psychopharmacological advances have been incorporated? We have problems enough in psychiatry without creating new ones. I would not forbid meddling, neither can I aid, abet or even condone it.

MYRE SIM.

*The Queen Elizabeth Hospital,  
Queen Elizabeth Medical Centre,  
Edgbaston,  
Birmingham, B15 2TH.*

#### PERSONALITY VARIABLES AND ALPHA ENHANCEMENT

DEAR SIR,

The paper by Travis *et al.* (*Journal*, June 1974) is interesting in that it claims to demonstrate a relationship between a personality variable, i.e. neuroticism, and feedback control of alpha rhythm. However, this conclusion is not justified on the basis of the evidence which they provide.

They do indeed demonstrate that over five training sessions an increase in alpha abundance occurred in both the high-N and low-N groups. However, Lynch and Paskewitz (1971) have pointed out that to select a period during which the subject is resting for measurements of baseline alpha is unacceptable in this context, so that the true measure of alpha enhancement is  $d\alpha/dt$ , i.e. the slope of the graph.

With this in mind, reference to the results of Travis *et al.* indicates that there is in fact no difference between the two groups. What they do demonstrate is that subjects with high N scores exhibit more eyes-open alpha.

It is also important to consider the significance of

an increased alpha abundance over time. In the light of the work of Cleland *et al.* (1971), who demonstrated higher alpha increments with non-contingent than with contingent feedback, it is impossible, in the absence of a non-contingent feedback control group, to ascribe such changes to feedback. An alternative and more parsimonious explanation is that anxiety about the experimental situation inhibits the production of alpha activity during the early part of the experiment, but as this anxiety habituates and the patient relaxes alpha abundance increases: Travis *et al.* have demonstrated that the rate of habituation is not related to N score.

This highlights some of the difficulties in the interpretation of results of brainwave feedback experiments: Lynch and Paskewitz (1971) feel that it is unlikely that true feedback control will ever be demonstrated unequivocally in man.

PAUL WILLIAMS.

*Department of Psychological Medicine,  
Heath Park,  
Cardiff.*

#### REFERENCES

- CLELAND, C. S. *et al.* (1971) Alpha enhancement: due to feedback or the nature of the task. *Psychophysiology*, 8, 2, 262.  
LYNCH, J. J. & PASKEWITZ, D. A. (1971) On the mechanisms of the feedback control of human brain wave activity. *J. nerv. ment. Dis.*, 153, 3, 205.  
TRAVIS, T. A., KONDON, C. Y. & KNOTT, J. R. (1974) Personality variables and alpha enhancement: a correlative study. *Brit. J. Psychiat.*, 124, 542.

#### NORTHERN IRELAND: MISLEADING 'PSYCHOLOGY'

DEAR SIR,

Dr. Aric's gentle review of Rona M. Fields' *Psychology of Northern Ireland* (*Journal*, July 1974, p. 107) underestimates the damaging effect of such a publication upon the credibility of psychology as a discipline. This book was published alongside a series of distinguished and useful publications in the field of education and psychology and as such may be accepted by many as having the same standing.

The obvious enthusiasm and concern of the author cloak her incredible naivety, and may lead less informed readers to accept such statements as that the internees were 'forced' to take pills which 'it turned out were Librium—a drug which has been found to have a debilitating effect on the parts of the nervous system involved in sexual arousal' (p. 154). The claims that 'no man or boy who has undergone interrogation, whether or not internment has followed, has not suffered a damaging personality

change' (p. 69) or that 60 per cent of all internees showed evidence of brain damage (p. 72) presumably due among other things to 'the hooding itself (which) resulted in a decreased supply of oxygen to the brain and central nervous system' (p. 73) are clearly ludicrous to any who have striven to detect brain damage or personality change following clearly established gross cerebral insult. The resurrection of the 'bromide in the tea' myth will amuse ex-servicemen, but more serious and difficult to refute is the claim that tortures were commonplace and included electro-shock applied to the genitals. One can only hope that this will be firmly and truthfully denied.

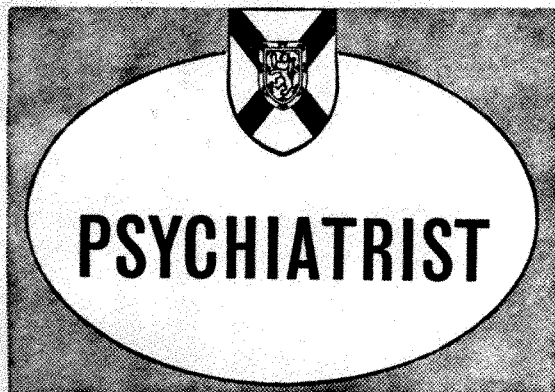
Unfortunately many of the claims and palpable inaccuracies have received wide publicity in the Irish press and have been accepted by many as

'scientific facts'. This book uses a false veneer of psychology to denigrate the medical services, the army and most hurtfully the people of Northern Ireland. It contributes nothing to the science of psychology and confuses the understanding of an already complex situation by adding further fuel to sectarian fires.

If Dr. Fields has any data which can contribute to an understanding of the issues she raises let her publish them in the scientific press where they can be submitted to scrutiny and evaluation by her peers.

S. BRANDON.

*Gaskell House,  
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<sup>1</sup> *Dis.Nerv. Syst.*, 1972, 33(7), 459

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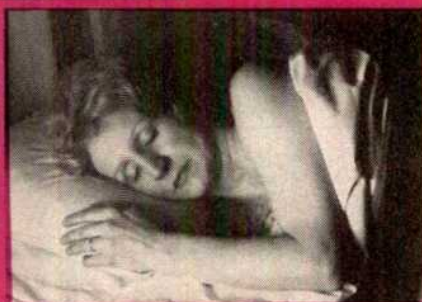
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- 1 *Modern Med.* 17, 438, 1972
- 2 *Practitioner*, 210, 135, 1973
- 3 *Am.J.Psychiatr.* 130, 1142, 1973
- 4 *Practitioner*, 198, 80, 1967
- 5 *J.Roy.Coll.Gen.Practit.* 23, Suppl. 2, 33, 1973
- 6 *Practitioner*, 199, 325, 1967

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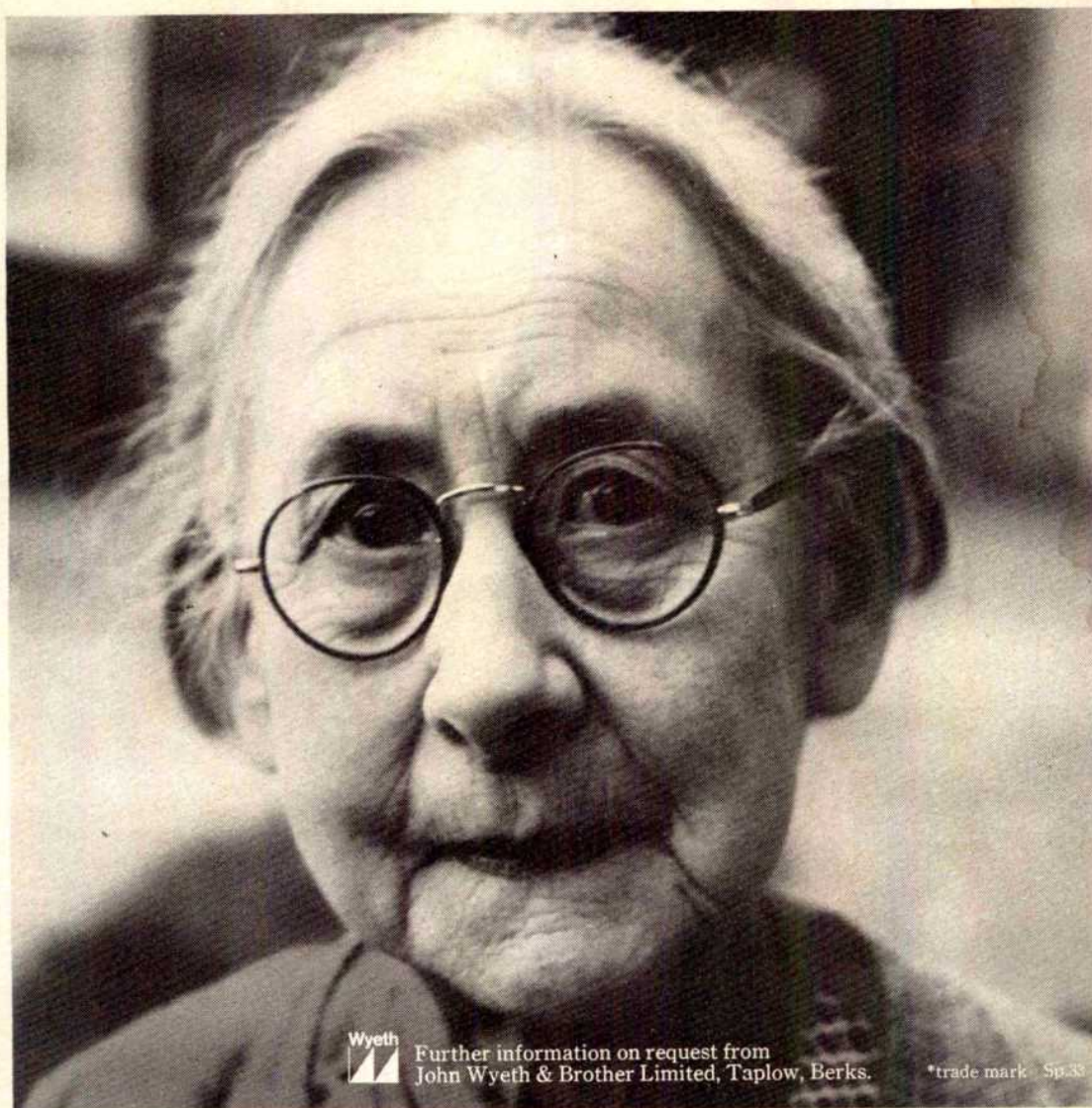
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Acute disturbances of liver function. Malignant tumours and wasting diseases. Because of transient catalytic action.

A history of thrombosis or embolism.

##### Side-effects

Inhibition of spermatogenesis. The sperm count and the volume of ejaculate are reduced. Infertility is usual, and there may be azoospermia after 8 weeks. There is usually slight atrophy of the seminiferous tubules. Follow-up examinations have shown these changes to be reversible.

Spermatogenesis usually returning to its previous state about 3-5 months after stopping Androcur, or, in some cases, up to 20 months. That spermatogenesis can recover even after very long treatment is not yet known. There is an evidence that abnormal sperm which might give rise to malformed embryos are produced during treatment with Androcur.

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Testicular pain. Transient patch loss and reduced growth of body hair, increased growth of scalp hair and lightening of hair colour. Healing of acne vulgaris. Weight changes. Female fat distribution and abdominal striae. Skin rashes. Headaches. Autonomic imbalance (gastric and vasomotor disturbances, sweating, flushing, fluctuations of blood pressure etc.).

##### Precautions and special information

Chronic liver disease. Although contra-indicated in acute liver disease, Androcur shows good liver tolerance in general. Nevertheless, liver function tests should be done before and every 4-6 weeks during treatment in patients who have chronic liver disease.

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Chronic alcoholism. Alcohol appears to reduce the effect of Androcur, which is of no value in chronic alcoholism.

Haemoglobin. Hypochromic anaemia has been found rarely during long-term treatment, and blood counts before and at intervals of 4-6 weeks during treatment are advisable.

Nitrogen balance. A negative nitrogen balance is usual at the start of treatment, but does not persist.

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Medico-legal considerations. Doctors are advised to ensure that the fully-informed consent of the patient to Androcur treatment is witnessed and can be verified.

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necessitate especial care while driving.

Note. Cyproterone acetate has been found to cause liver abnormalities in animals, including the development of tumours, but the relevance to man of this finding has not been established.

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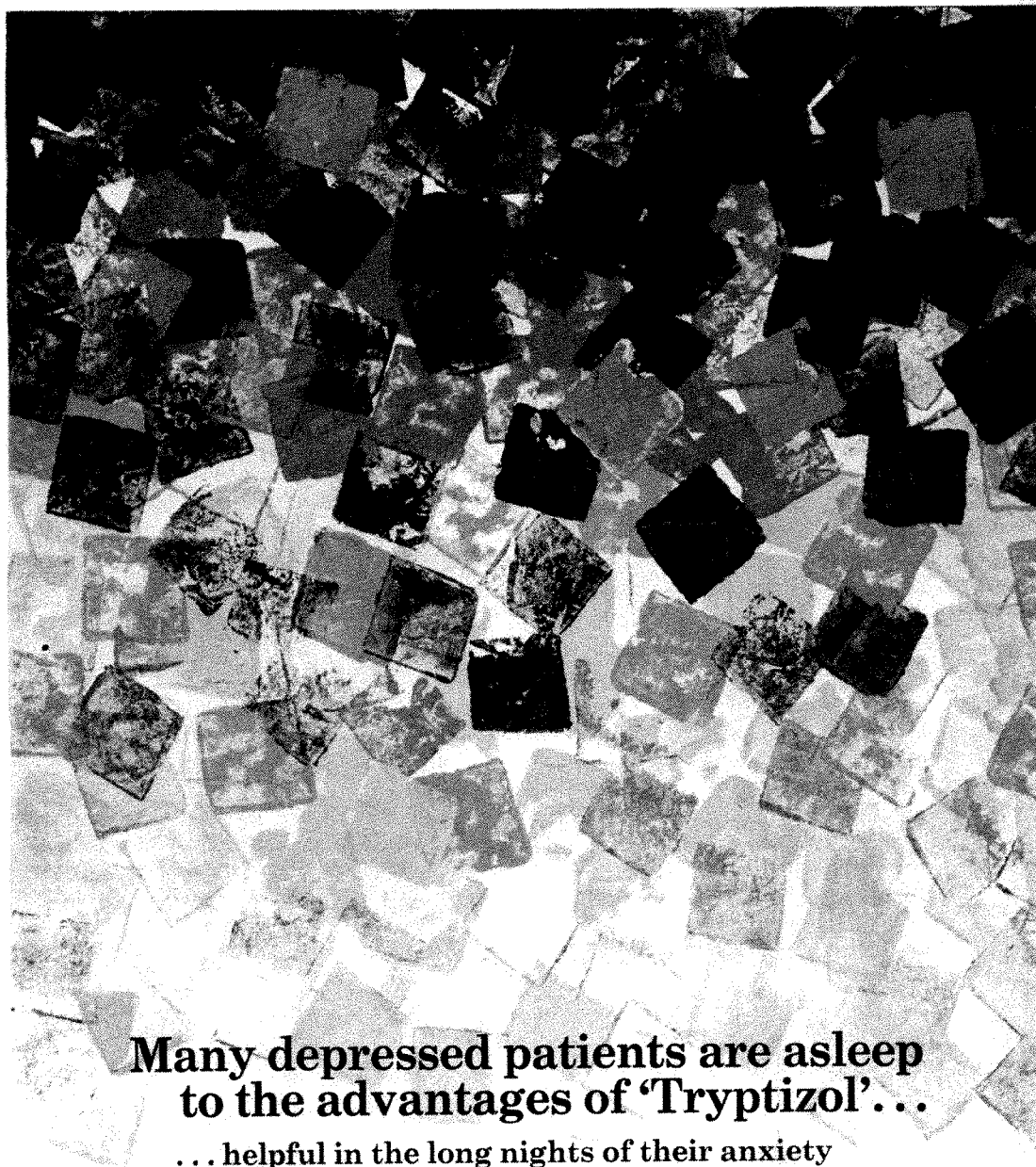
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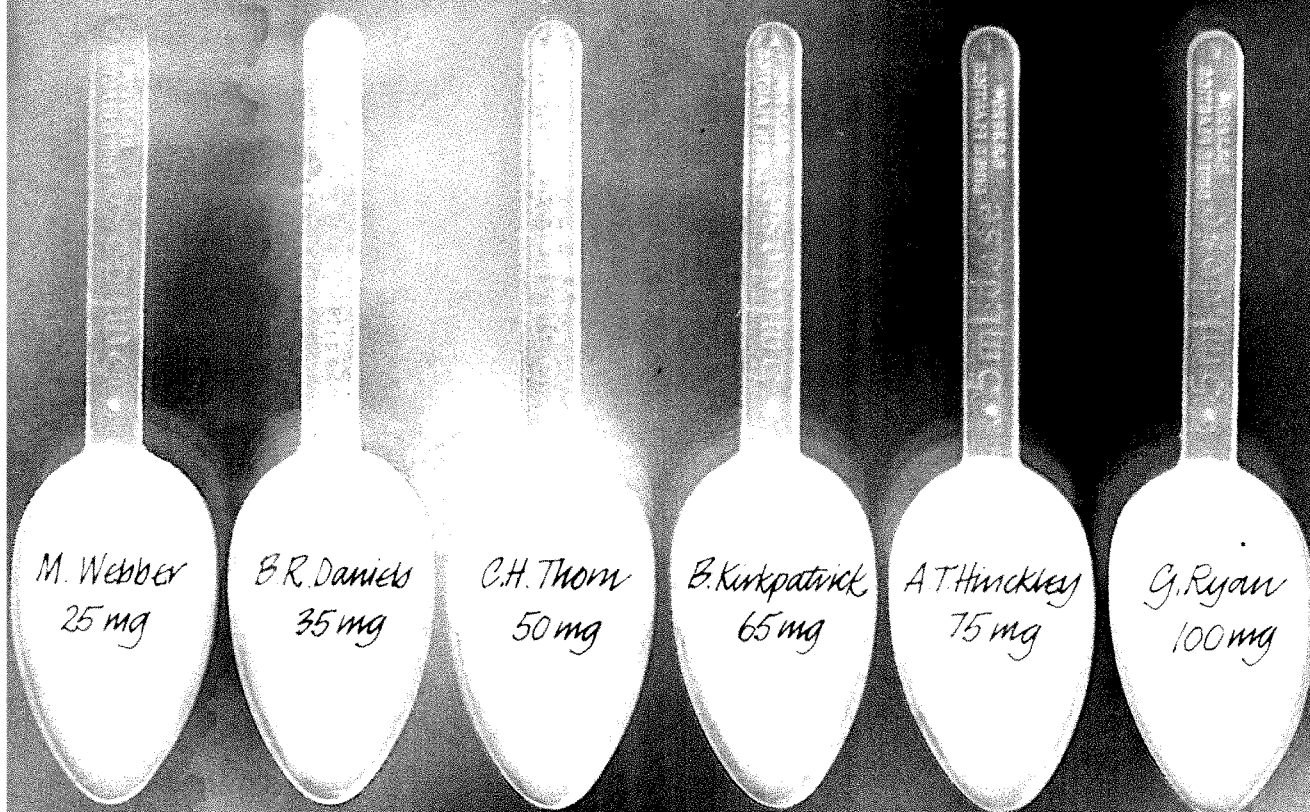
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# The Use of the W.H.O. International Classification of Diseases (Mental Retardation) in a Hospital for Mentally Handicapped

By DOUGLAS A. SPENCER

On 17 November 1969, Dr. A. A. Baker, then Senior Principal Medical Officer, Department of Health and Social Security, sent a letter to consultants at mental subnormality hospitals in which he requested them to introduce the World Health Organization International Classification of Diseases, Eighth Edition, 1965, in the completion of Mental Health Inquiry Index Cards. The booklet *A Glossary of Mental Disorders*, No. 22 in the General Register Office Studies on Medical and Population Subjects was enclosed with the letter for information and to facilitate the use of the Classification.

At Meanwood Park Hospital, Leeds, the section on 'Mental Retardation' in the Glossary was brought into use in 1970 for new admissions, and the classification was subsequently applied to all the patients resident in the hospital. The psychology department established in 1969 carried out the intellectual assessments of the patients, and the diagnosis of each case was reviewed in order to complete the aetiological sub-division of the Classification.

An outline of the Classification is given here for the information of readers, and Tables I and II record the Classification, firstly in terms of intellectual status, and secondly in respect of the fourth digit sub-division which denotes aetiology, for the 600 long-term patients in Meanwood Park Hospital.

## THE CLASSIFICATION

### Three digit categories

|     |                               |             |
|-----|-------------------------------|-------------|
| 310 | Borderline mental retardation | IQ 68-85    |
| 311 | Mild mental retardation       | IQ 52-67    |
| 312 | Moderate mental retardation   | IQ 36-51    |
| 313 | Severe mental retardation     | IQ 20-35    |
| 314 | Profound mental retardation   | IQ under 20 |

### Fourth digit sub-division used with above categories

|    |                                                                              |
|----|------------------------------------------------------------------------------|
| ·0 | Following infections and intoxication                                        |
| ·1 | Following trauma or physical agents                                          |
| ·2 | With disorders of metabolism growth and nutrition                            |
| ·3 | Associated with gross brain disease (post natal)                             |
| ·4 | Associated with diseases and conditions due to (unknown) pre-natal influence |
| ·5 | With chromosomal abnormalities                                               |
| ·6 | Associated with prematurity                                                  |
| ·7 | Following major psychiatric disorder                                         |
| ·8 | With psycho-social (environmental) deprivation                               |
| ·9 | Other and unspecified                                                        |

## THE VALUE AND USE OF THE CLASSIFICATION

The classification code numbers provide a convenient shorthand for the categorization of patients. With practice, medical staff, psychologists, nurses and others become familiar with the implications of the numbers used in the codes. The different categories 'borderline', 'mild', 'moderate', 'severe', 'profound' in respect of the intellectual level are more meaningful and acceptable than the obsolete 'idiot', 'imbecile'

TABLE I  
*Number of patients in the I.C.D. codes 310-315 by sex*

| 310     |   | 311   |    | 312 |     | 313   |    | 314 |    | Totals |     |
|---------|---|-------|----|-----|-----|-------|----|-----|----|--------|-----|
| M       | F | M     | F  | M   | F   | M     | F  | M   | F  | M      | F   |
| 3       | 5 | 22    | 32 | 67  | 108 | 106   | 75 | 106 | 75 | 304    | 296 |
| Totals: |   | 62    |    |     |     | 538   |    |     |    | 600    |     |
|         |   | 10.3% |    |     |     | 89.7% |    |     |    | 100%   |     |

TABLE II  
*Number of patients in the fourth digit subdivisions of the I.C.D. codes 310-315 sexes together*

|            |       | .0  | .1  | .2  | .3  | .4   | .5  | .6  | .7  | .8  | .9   | Totals |
|------------|-------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|--------|
| Totals     | .. .. | 30  | 17  | 21  | 6   | 181  | 56  | 3   | 5   | 21  | 260  | 600    |
| % of total | .. .. | 5.0 | 2.9 | 3.5 | 1.0 | 30.2 | 9.3 | 0.5 | 0.8 | 3.5 | 43.3 | 100.0  |

and 'feeble-minded', the 'subnormal' and 'severely subnormal' dichotomy of the Mental Health Act (England and Wales) 1959, nomenclature, or the institutional label of 'low grade' and 'high grade' patients.

#### DEGREES OF RETARDATION

The table showing the degrees of retardation reflects the changing pattern within the hospital population as the more able residents have been discharged and their places taken by more seriously handicapped patients. In the 'mild' and 'borderline' groups 62 patients still remain in the hospital, their potential for discharge being impaired as much by mental illness and their instability of character and personality as by their sub-average intelligence.

The numbers of 'severely subnormal' patients ('moderately', 'severely' and 'profoundly' retarded categories) in the hospital is 538, of whom 363 are in the 'severely' and 'profoundly retarded' categories. The Command Paper 4683 *Better Services for the Mentally Handicapped*, H.M.S.O., June 1971, foreshadows a gradual reduction of hospital places in the future of approximately half the present provision. In the case of the hospital under study the achievement of this would require the transfer of a not inconsiderable number of the 'moderately' retarded group into alternative accommodation in the community.

The figures reveal that a high proportion of the resident patients are in the 'severely' and 'profoundly' retarded categories. These patients present an increasing burden to the nursing staff because of their high dependency. Some of the villas contain a majority of residents in these categories.

#### THE AETIOLOGICAL CLASSIFICATION

In assigning patients to the various aetiological categories some difficulties and limita-

tions have to be acknowledged in an ordinary hospital for the mentally handicapped. There is a dearth of records about the early clinical histories of many patients, especially those admitted to the hospital before the introduction of the National Health Service. Relatives of these patients may not be alive to provide information.

At Meanwood Park Hospital a screening of urine samples for inborn errors of metabolism had been carried out in 1969 (Dickinson, 1969). In this survey 777 in-patients were tested. Since then the number of in-patients has been reduced to 600 and at the time of this study some of the patients in the original screening had died or had been transferred to other hospitals.

A comprehensive cytogenetic study of the patients has not been possible at this hospital. Unusually tall patients and some other patients have been selected on account of abnormal physical and dermatoglyphic features for examination of buccal smears and chromosomal analysis. One man with the 48 XXY chromosome constitution was discovered. Few of the long-stay patients with Down's syndrome, which comprised 10 per cent of the population, have had chromosomal analyses, because it was considered that for most of them such a relatively expensive investigation could not be given a high priority in the work of the Regional chromosome reference centre.

In many cases in which the aetiology was uncertain parents and relatives were asked for more details about the pregnancy, birth and childhood illnesses of the patients. The hospital social worker assisted in the obtaining of information by domiciliary interviews. Nevertheless, in 261 of the 600 patients only a diagnosis of unspecified or uncertain cause was possible. If to this category are added the 181 cases attributed to 'unknown prenatal influence', which included some specific conditions, and a



number of patients in whom an early developmental defect was presumed, then in 50 per cent of the population the aetiology of the mental retardation was uncertain. Among the rare syndromes in the hospital were one example each of Laurence-Moon-Biedl syndrome, Apert's syndrome, Rubinstein-Taybi syndrome, Prader-Willi syndrome and Waardenburg's syndrome respectively. The relatively small number of cases in some of the categories reflects the difficulty and uncertainty of retrospective studies. As the hospital has a majority of severely subnormal patients, the number of cases with psychosocial (environmental) deprivation and cultural familial mental retardation is small.

#### SUMMARY

In 1969 consultants in hospitals for the mentally handicapped were asked to use the booklet *A Glossary of Mental Disorders* published by the General Register Office in the completion of Mental Health Inquiry Index Cards.

Six hundred long-stay mentally handicapped in-patients were classified according to the

section on 'Mental Retardation' in the Glossary. The numbers of patients in each of the intellectual and aetiological subdivisions of this classification were tabulated with respect to the wards in the hospital.

This Glossary is a useful instrument for the classification of the residents in a hospital for the mentally handicapped. Medical, nursing and other staff become accustomed to the meaning of the code numbers used. The classification provides a convenient means of presenting the intellectual levels and diagnostic categories of the patients in the hospital. Some of the difficulties encountered in the aetiological categorization of patients are described.

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## Transcultural Influences on Psychiatrists' Rating of Verbally Expressed Emotion

By J. P. LEFF

In a previous paper (Leff, 1973) data from the International Pilot Study of Schizophrenia (IPSS) (WHO, 1974) were analysed, and it was found that patients from developed countries showed a greater ability to differentiate between unpleasant emotional states than those from developing countries. The data on which this finding was based were scores derived from the sections on Depression, Anxiety and Irritability in the Present State Examination (PSE), a semi-structured psychiatric interview (Wing, Cooper and Sartorius, 1974). The scores were the sums of ratings made by psychiatrists interviewing patients from their own countries. The psychiatrists judged whether or not a symptom was present on the basis of the patient's verbal response to a series of questions, most of which are stipulated in the PSE. The patient's non-verbal behaviour is not taken into account in making these ratings.

It was realized subsequently that the differences found between developed and developing countries might result from variations in the way the psychiatrists perceived the patients' responses rather than representing actual differences between the patients. Psychiatrists in developing countries are drawn from the upper strata of their societies and have had far more exposure to influences from developed countries than the average person in their culture. They have often spent extensive time abroad, usually in training, and have been involved with people and ideas from other cultures. Hence, the possibility that the psychiatrists were misperceiving the patients' verbal expression of emotion was thought to be worth investigating, particularly as data already existed which could be used for this purpose.

The International Pilot Study of Schizophrenia is a transcultural psychiatric investiga-

tion of 1,202 patients in nine countries: Colombia, Czechoslovakia, Denmark, India, Nigeria, China, Union of Soviet Socialist Republics, United Kingdom, and United States of America. It was designed as a pilot study to lay scientific groundwork for future international epidemiological studies of schizophrenia and other psychiatric disorders. An important part of the methodology was that all the psychiatrists involved in interviewing should have been trained to use the PSE in the same way. It was considered essential to make regular checks on reliability to ensure that the psychiatrists did not introduce variations in rating and interviewing technique over time. Exchanges of visits were made at regular intervals throughout the study and involved representatives from all nine centres. At these meetings, videotaped, filmed and live interviews of patients were shown and were rated by all the psychiatrists present. In all, 26 interviews with patients were used in reliability exercises. Sixteen of the patients either spoke English as their native language or were fluent enough to be interviewed in English. For the remainder of the interviews simultaneous translations into English were provided. As English has an extensive vocabulary for unpleasant emotional states, the translation should not have given rise to any difficulties, but the influence of even a perfect translation on the ratings of psychiatric symptoms has not been adequately studied.

Of the nine countries taking part in the IPSS, five may be considered to be technologically developed—Czechoslovakia, Denmark, Union of Soviet Socialist Republics, United Kingdom, and United States of America. The remaining four—Colombia, India, Nigeria and China—may be described as developing in the technological sense. To avoid clumsy phrases, the

centres sited in developing countries will be termed Group A, while those in developed countries will be referred to as Group B. The reliability exercises provided data on psychiatrists from Group A and Group B centres rating patients from Group A and Group B centres. This allows us to explore transcultural influences on the psychiatrists' rating of the patients. The numbers of raters and patients from the various centres is shown in Table I.

The scores on three sections of the PSE, Anxiety, Depression and Irritability, were dealt with in the same way as in the previous study (Leff, 1973). The correlation coefficients be-

tween the scores were calculated for four rating combinations: patients from Group A centres rated by psychiatrists from Group A and from Group B centres, and patients from Group B centres rated by psychiatrists from Group A and from Group B centres. A low correlation coefficient between two scores is taken to indicate a high degree of differentiation between the two emotions concerned.

#### RESULTS

Table II shows the correlation coefficients between the section scores for the various combinations of psychiatrists and patients.

TABLE I  
*The number of raters from each centre rating patients from the various centres*

| Patient centre | Rater centre |                |            |               |                |             |                 |              |                   |                       | Total |
|----------------|--------------|----------------|------------|---------------|----------------|-------------|-----------------|--------------|-------------------|-----------------------|-------|
|                | H.Q. Geneva  | Aarhus Denmark | Agra India | Cali Colombia | Ibadan Nigeria | London U.K. | Moscow U.S.S.R. | Taipei China | Washington U.S.A. | Prague Czechoslovakia |       |
| Denmark        | 2            | 8              | 0          | 4             | 0              | 0           | 0               | 0            | 0                 | 4                     | 18    |
| India          | 9            | 2              | 11         | 0             | 0              | 0           | 3               | 3            | 0                 | 0                     | 28    |
| Colombia       | 0            | 0              | 0          | 12            | 2              | 0           | 0               | 0            | 3                 | 0                     | 17    |
| Nigeria        | 6            | 4              | 4          | 3             | 4              | 5           | 5               | 5            | 6                 | 4                     | 46    |
| U.K.*          | 13           | 18             | 9          | 16            | 5              | 7           | 2               | 12           | 11                | 8                     | 101   |
| U.S.S.R.       | 2            | 0              | 0          | 0             | 0              | 3           | 21              | 0            | 0                 | 0                     | 26    |
| China          | 0            | 0              | 0          | 0             | 0              | 0           | 0               | 0            | 0                 | 0                     | 0     |
| U.S.A.         | 2            | 2              | 2          | 2             | 2              | 2           | 0               | 2            | 3                 | 2                     | 19    |
| Czechoslovakia | 3            | 2              | 2          | 2             | 1              | 4           | 1               | 1            | 3                 | 5                     | 24    |
| Total          | 37           | 36             | 28         | 39            | 14             | 21          | 32              | 23           | 26                | 23                    | 279   |

\* Two patients from Edinburgh are included with the London patients.

TABLE II  
*Correlation coefficients between the section scores*

|                                                | Number of rated interviews | Anxiety : Depression | Depression : Irritability | Anxiety : Irritability |
|------------------------------------------------|----------------------------|----------------------|---------------------------|------------------------|
| Group A psychiatrists rating Group A patients  | 26                         | .68†                 | .80†                      | .50*                   |
| Group B psychiatrists ratings Group A patients | 30                         | .79†                 | .33                       | .27                    |
| Group A psychiatrists rating Group B patients  | 52                         | .39*                 | -.24                      | -.21                   |
| Group B psychiatrists rating Group B patients  | 95                         | .44†                 | .02                       | -.07                   |

\*  $p < .01$ ; †  $p < .001$

The results are very similar to those reported for the main sample of IPSS patients (Leff, 1973). Group B patients have low correlations, except in the area Anxiety : Depression, while Group A patients have high correlations in all three areas. However, whereas there is close agreement between Group A and Group B psychiatrists rating Group B patients, the correlation coefficients derived from these two groups' ratings of Group A patients reveal substantial differences. The significance of these differences was tested by transforming the correlation coefficients into Z scores in order to normalize them, and then applying the Critical Ratio test. These results are set out in Table III.

This test confirms that Group A psychiatrists do not differ from Group B psychiatrists in their ratings of the verbal expression of emotion by Group B patients. However, their ratings of Group A patients yield a significantly higher correlation in the area Depression : Irritability than those of Group B psychiatrists. As a reflection of this, Group B psychiatrists' ratings of Group A patients yield a significantly higher correlation than their ratings of Group B patients in only one area. By contrast, Group A psychiatrists' ratings yield significantly higher correlations in all three areas.

#### DISCUSSION

The data from the reliability exercises of the IPSS show that psychiatrists from developing

centres do not differ from their colleagues from developed centres in viewing developed centre patients as showing a high degree of emotional differentiation. This is not unexpected, as not only do developing centre psychiatrists belong to the most sophisticated stratum of their respective cultures, but many of them have been trained in psychiatry in developed centres and are experienced in evaluating patients from developed countries. Furthermore, as part of the IPSS the developing centre psychiatrists went through a training procedure in common with developed centre psychiatrists which was designed to produce uniformity of rating. The surprising finding is that when it comes to rating verbally expressed emotion in developing centre patients significant differences appear between the two groups of psychiatrists. The results indicate that the developed centre psychiatrists assess the developing centre patients as capable of a greater degree of emotional differentiation than do the developing centre psychiatrists. It is not possible to decide from these data which group of psychiatrists is making the more accurate assessment. On the one hand, it could be that developed centre psychiatrists are imposing a greater differentiation on developing centre patients because this is what they have come to expect from their experience with patients from their own developed centres. Although their ratings of developing centre patients yield uniformly higher correlation coefficients than

TABLE III  
*Comparisons between the correlation coefficients of the various rating combinations*

|                                                                 | Critical Ratio and level of significance |                           |                        |
|-----------------------------------------------------------------|------------------------------------------|---------------------------|------------------------|
|                                                                 | Anxiety : Depression                     | Depression : Irritability | Anxiety : Irritability |
| Group A and Group B psychiatrists rating Group A patients ..    | 0.82<br>n.s.                             | 2.71<br>$p < .01$         | 0.95<br>n.s.           |
| Group A and Group B psychiatrists rating Group B patients ..    | 0.03<br>n.s.                             | 1.53<br>n.s.              | 0.77<br>n.s.           |
| Group A psychiatrists rating Group A and Group B patients .. .. | 1.65<br>$p < .1$                         | 5.36<br>$p < .001$        | 3.00<br>$p < .01$      |
| Group B psychiatrists rating Group A and Group B patients .. .. | 2.70<br>$p < .01$                        | 1.44<br>n.s.              | 1.61<br>n.s.           |



their ratings of developed centre patients, the pattern of statistical significance is the same for both groups.

An alternative explanation is that developing centre psychiatrists could be underestimating the emotional differentiation of developing centre patients. It is difficult to see why this should occur, since developing centre psychiatrists are certainly capable of perceiving a high degree of emotional differentiation, as shown by their ratings of developed centre patients. As indicated above, many of the developing centre psychiatrists had accumulated extensive experience of evaluating patients in developed countries, whereas few if any of the developed centre psychiatrists had much experience of patients in developing countries. Consequently, the former explanation seems the more plausible.

In either case, the greater capability of patients from developed centres for emotional differentiation compared with those from developing centres is confirmed. These results have important implications for one of the additional findings of the earlier study (Leff, 1973). It was found that a group of black American patients, constituting part of the US : UK project (Cooper *et al.*, 1972), showed significantly higher correlations between Depression and Irritability, and between Anxiety and Irritability than a group of white American patients matched exactly on social class, age and sex. It was considered possible that this finding might be attributable to the white interviewers' different perception of the black and the white patients. It appears from the findings of the reliability exercises that if developed centre psychiatrists are introducing a bias into their assessment of developing centre patients it consists of an overestimate of these patients' differentiating ability. If this overestimation was affecting the raters in the US : UK project it would mean that the difference found between the black and the white patients is an underestimate of the actual difference. It seems from this that we can dismiss biased rating as a cause of the difference found between the black and the white patients. The possibility still exists that this difference could result from other characteristics of the interview. The response of a black American patient to a white psychiatrist is likely to be very

different from that of a white American patient. The importance of this factor in the setting of a semi-structured interview such as the PSE remains to be elucidated by using black American psychiatrists as interviewers.

#### SUMMARY

The reliability exercises that formed part of the International Pilot Study of Schizophrenia were used to explore any possible differences between psychiatrists from the various centres in the way they perceived patients' verbal expression of emotion. It was found that psychiatrists from developed centres agreed with psychiatrists from developing centres in their perception of the degree of emotional differentiation shown by patients from developed centres. However their ratings of patients from developing centres indicated a significant disagreement. Psychiatrists from developing centres saw these patients as exhibiting a relatively low degree of emotional differentiation, whereas their colleagues from developed centres rated them significantly higher in this respect. The possible reasons for this disagreement are discussed and it is concluded that the assessment by the developing centre psychiatrists is more likely to be accurate.

#### ACKNOWLEDGEMENTS

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The views expressed in this paper are the author's own and do not necessarily represent those of all the IPSS collaborating investigators nor the stated policy on decisions of WHO.

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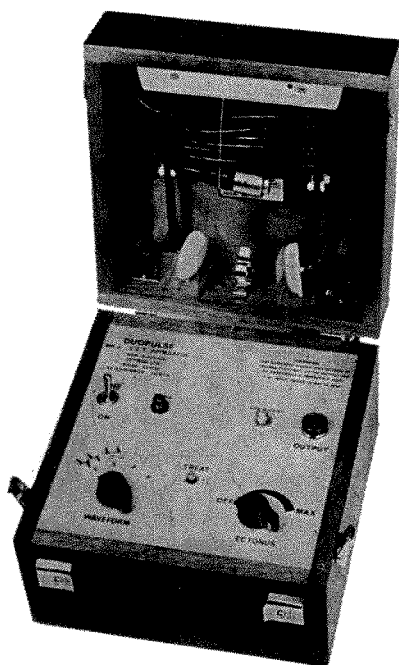
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# A Re-analysis of the Reliability of Psychiatric Diagnosis

By ROBERT L. SPITZER and JOSEPH L. FLEISS

## INTRODUCTION

Classification systems such as diagnosis have two primary properties, reliability and validity. Reliability refers to the consistency with which subjects are classified; validity, to the utility of the system for its various purposes. In the case of psychiatric diagnosis, the purposes of the classification system are communication about clinical features, aetiology, course of illness and treatment. A necessary constraint on the validity of a system is its reliability. There is no guarantee that a reliable system is valid, but assuredly an unreliable system must be invalid.

Studies of the reliability of psychiatric diagnosis provide information on the upper limits of its validity. This paper discusses some of the difficulties in appraising diagnostic reliability, offers a re-analysis of available data from the literature, and suggests a possible course of action to improve psychiatric diagnosis.

Zubin (1967) reviewed the major studies of the reliability of psychiatric diagnosis performed until 1966. He noted that diagnostic reliability is referred to in three different ways: agreement between independent diagnosticians examining the same patients, stability in diagnosis over time, and similarity in diagnostic frequencies for comparable samples. It is the first sense—interjudge agreement—that is fundamental.

There are inherent limitations to the interpretation of the other two uses of the term. For agreement between initial and subsequent diagnosis, one must consider the possibility that some of the disagreement may be due to changes in the patient's condition and not just to unreliability. The difficulty with interpreting differences in distributions between populations is that one is forced to assume, often without evidence, that the populations do not differ in psychopathology, when in fact they may.

## MEASURING DIAGNOSTIC RELIABILITY

More studies of diagnostic reliability have been of the interjudge type than of either of the other two types. There are two features of the data reported in these studies, however, which limit an assimilation of their results. One is the choice of an index of agreement and the other is a failure to take into account the base rates of the various diagnoses. The hypothetical data of Table I will illustrate some of the complexities involved in measuring diagnostic agreement.

TABLE I  
*Hypothetical data (in proportions) for agreement on three diagnoses by two diagnosticians*

| Diagnostician A | Diagnostician B |          |         | Total |
|-----------------|-----------------|----------|---------|-------|
|                 | Psychosis       | Neurosis | Organic |       |
| Psychosis ..    | ·75             | ·01      | ·04     | ·80   |
| Neurosis ..     | ·05             | ·04      | ·01     | ·10   |
| Organic ..      | 0               | 0        | ·10     | ·10   |
| Total ..        | ·80             | ·05      | ·15     | 1·00  |

To measure the degree of agreement on a single diagnosis (e.g. neurosis), one may collapse the original table into a 2 × 2 table as shown in Table II. Some studies (Schmidt and Fonda, 1956; Kreitman, 1961) report the proportion of overall agreement, i.e., the proportion of all patients on whom there is agreement as to the

TABLE II  
*Hypothetical data (in proportions) for agreement on neurosis by two diagnosticians, from Table I*

| Diagnostician A | Diagnostician B |       | Total |
|-----------------|-----------------|-------|-------|
|                 | Neurosis        | Other |       |
| Neurosis ..     | ·04             | ·06   | ·10   |
| Other ..        | ·01             | ·89   | ·90   |
| Total ..        | ·05             | ·95   | 1·00  |

presence or the absence of the diagnosis. For the data of Table II, the proportion of overall agreement is  $.04 + .89 = .93$ .

Other studies (Beck *et al.*, 1962; Sandifer *et al.*, 1964) report the proportion of specific agreement, which is an index obtained by ignoring all subjects agreed upon as not having the given diagnosis (in Table II, ignoring the 89 per cent of patients agreed upon as not having a neurosis). One first determines the average proportion of all subjects given the specified diagnosis by either diagnostician (for the data of Table II, this proportion is  $\frac{1}{2} (.10 + .05) = .075$ ), and then finds the proportion agreed upon as having that diagnosis (for the present example, this proportion is  $.04$ ). The proportion of specific agreement is the ratio of these two proportions. For the data of Table II the resulting value is  $.04 / .075 = .53$ . This index can be interpreted as the probability that one diagnostician will make the specified diagnosis given that the other has done so.

Table III presents the values of the two indices of agreement for the three diagnoses of Table I. The two indices order the diagnoses quite differently. The proportions of overall agreement seem to be similar, with that for organic brain syndrome being best and that for neurosis being second best. The proportions of specific agreement are of different orders of magnitude, and indicate that agreement on psychosis is best and agreement on neurosis poorest.

TABLE III  
Indices of agreement between two diagnosticians on three diagnoses of Table I

| Diagnosis    | Proportion of overall agreement |                         | Proportion of specific agreement |                         | Kappa |
|--------------|---------------------------------|-------------------------|----------------------------------|-------------------------|-------|
|              | Ob-<br>tained                   | Chance<br>ex-<br>pected | Ob-<br>tained                    | Chance<br>ex-<br>pected |       |
| Psychosis .. | .90                             | .68                     | .94                              | .80                     | .69   |
| Neurosis ..  | .93                             | .86                     | .53                              | .07                     | .50   |
| Organic ..   | .95                             | .78                     | .80                              | .12                     | .77   |

The two indices are obviously not comparable. A further complication is that neither can be interpreted independently of the rates at which the diagnoses are made. For one

thing, the values associated with the poorest possible agreement may be appreciably greater than 0. For example, given that the two diagnosticians diagnose psychosis 80 per cent of the time, the lowest value possible for the proportion of overall agreement on psychosis is  $.60$  and the lowest value possible for the proportion of specific agreement on psychosis is  $.75$ .

Secondly, some degree of agreement is to be expected solely on the basis of chance. To take an extreme example, suppose that diagnosticians A and B jointly diagnosed a sample of patients without even examining them, but merely kept to their usual base rates. One would then expect that 64 per cent of the time ( $= .8 \times .8$ ), they would agree on the diagnosis of psychosis. Given their base rates, only agreement beyond that expected by chance alone would be meaningful.

A statistic for measuring agreement on nominal categories such as diagnosis, which incorporates a correction for chance, was originally proposed by Cohen (1960) and later generalized by Spitzer *et al.* (1967a), Cohen (1968), Fleiss (1971), Light (1971), and Fleiss *et al.* (1972). The statistic, named kappa, contrasts the observed proportion of agreement with the proportion expected by chance alone by means of the formula  $\text{kappa} = (p_o - p_e) / (1 - p_e)$ , where  $p_o$  is the observed proportion of agreement and  $p_e$  is the proportion expected by chance.

Whether  $p_o$  is taken to be the proportion of overall agreement or the proportion of specific agreement, one obtains identically equal values of kappa after correcting for chance. The term  $p_e$  is obtained by determining expected cell frequencies (as one does, e.g., in calculating the standard chi square statistic), and then calculating the proportion of agreement on the table with expected frequencies. Kappa varies from negative values for less than chance agreement, though 0 for chance agreement, to  $+1.0$  for perfect agreement. Kappa may be interpreted as an intra-class correlation coefficient (Fleiss and Cohen, 1973).

Table III gives the chance expected values of the two proportions of agreement and the resulting values of kappa. The ordering effected by kappa is different from either of the other two order-



ings. After correcting for chance, one finds agreement to be best for organic brain syndrome, next best for psychosis, and poorest for neurosis.

#### STUDIES OF DIAGNOSTIC RELIABILITY

The major studies of the reliability of psychiatric diagnosis, fortunately, report both the base rates and the diagnostic agreement values, thus permitting the calculation of chance corrected agreement, kappa.

(I) Schmidt and Fonda (1956) studied 426 patients admitted to a state hospital in Connecticut. Each patient was diagnosed within the first week of admission by one of a group of eight psychiatric residents, and within the third week by one of three senior psychiatrists. The data available to the psychiatric residents were the usual admission reports as well as their own physical and mental status examination. The data available to the senior psychiatrist included all of the data available to the psychiatric residents as well as additional data that had been collected by other staff members and by themselves during their own brief examinations.

(II) Kreitman (1961) studied 90 consecutive new referrals to an out-patient clinic in England. Each patient was interviewed by one of three consulting psychiatrists, and completely independently by one of two research psychiatrists. The only sources of information to both sets of psychiatrists were the patient, a family member and a letter of referral.

(III) Beck *et al.* (1962) studied 153 patients randomly selected from new referrals to two out-patient services in Philadelphia. Each patient was randomly assigned to be interviewed by two of four experienced psychiatrists. Each psychiatrist conducted an independent interview and apparently had no source of information other than the patient himself.

(IV) Sandifer *et al.* (1964) studied 91 patients from three hospitals in North Carolina. A psychiatric resident presented material about each patient to a group of ten experienced psychiatrists. Following each presentation the patient was interviewed by one of the 10 diagnosticians. After jointly observing the

patient, each diagnostician made his own diagnosis.

(V) The U.S.-U.K. Diagnostic Project (Cooper *et al.*, 1972) conducted a series of studies comparing diagnostic practice in the United States and the United Kingdom. In one study, 250 consecutive admissions to a single New York State mental hospital and 250 consecutive admissions to a London area mental hospital were diagnosed by the hospital physician according to his usual practices, and independently by members of the project, who used a structured interview schedule. In a second study, 192 consecutive admissions to nine New York State mental hospitals and 174 consecutive admissions to nine London area mental hospitals were studied similarly. Most of the project members had received their psychiatric training in London. Because the results of the two studies within for each city were similar, only mean agreement values for the New York and the London samples are reported. The agreement measured is between the project's and the hospitals' psychiatrists.

(VI) Spitzer *et al.* (in preparation) studied 100 consecutive admissions to the Washington Heights Community Service of the New York State Psychiatric Institute. Each patient was diagnosed by one of 15 admitting residents within the first few days of admission. Each patient was also diagnosed up to three months after admission by one of two supervising psychiatrists after reviewing the case record prepared by the admitting resident. No attempt was made to prevent the admitting therapist from discussing his diagnostic formulation with the supervising psychiatrist. It is assumed that such discussions often took place, though not invariably.

#### RESULTS

Table IV presents the values of kappa calculated from the data presented in the original reports. Values are reported only for those categories for which original data were provided. Although the different studies used slightly different classification schemes (American Psychiatric Association, 1952 and 1968; H.M. Stationery Office, 1968), the results are reported for broad categories whose definitions

TABLE IV  
*Kappa coefficients of agreement on broad and specific diagnostic categories from six studies*

| Category                            | Study |     |     |     |                  |              | Mean |
|-------------------------------------|-------|-----|-----|-----|------------------|--------------|------|
|                                     | I     | II  | III | IV  | V<br>New<br>York | VI<br>London |      |
| Mental deficiency .. ..             |       |     |     | .72 |                  |              | .72  |
| Organic brain syndrome ..           | .82   | .90 |     |     |                  | .59          | .77  |
| Acute brain syndrome ..             |       |     |     | .44 |                  |              | .44  |
| Chronic brain syndrome ..           |       |     |     | .64 |                  |              | .64  |
| Alcoholism .. ..                    |       |     |     |     | .74              | .68          | .71  |
| Psychosis .. ..                     | .73   | .62 |     | .56 | .42              | .43          | .55  |
| Schizophrenia .. ..                 | .77   |     | .42 | .68 | .32              | .60          | .57  |
| Affective disorder .. ..            |       |     |     |     | .19              | .44          | .41  |
| Neurotic depression .. ..           |       |     | .47 |     | .20              | .10          | .26  |
| Psychotic depression .. ..          |       |     |     | .19 | .24              | .30          | .24  |
| Manic-depressive .. ..              |       |     |     | .33 |                  |              | .33  |
| Involutional depression ..          |       |     | .38 | .21 |                  |              | .30  |
| Personality disorder or Neurosis .. | .63   |     |     | .51 | .24              | .36          | .44  |
| Personality disorder .. ..          |       |     | .33 | .56 | .19              | .22          | .32  |
| Sociopathic .. ..                   |       |     | .53 |     |                  |              | .53  |
| Neurosis .. ..                      |       | .52 |     | .42 | .26              | .30          | .40  |
| Anxiety reaction .. ..              |       |     | .45 |     |                  |              | .45  |
| Psychophysiological reaction ..     |       |     |     | .38 |                  |              | .38  |

are similar in all of the classification systems used.

There are no diagnostic categories for which reliability is uniformly high. Reliability appears to be only satisfactory for three categories: mental deficiency, organic brain syndrome (but not its subtypes), and alcoholism. The level of reliability is no better than fair for psychosis and schizophrenia and is poor for the remaining categories. Using uncorrected agreement values, Zubin (1967) found agreement on the combined category of personality disorder and neurosis to be almost as high as for psychosis. It is clear from Table IV that after correction for chance, agreement on the combined category is poorer than on psychosis.

With the exception of the U.S.-U.K. study (number V) of the New York hospitals, all the studies summarized here involved diagnosticians of similar background and training. In addition,

special efforts were made in some of the studies to have the participant diagnosticians come to some agreement on diagnostic principles prior to the beginning of the study. One would have expected these features of similar background and prior consensus on principles to contribute to good reliability. One can only assume, therefore, that agreement between heterogeneous diagnosticians of different orientations and backgrounds, as they act in routine clinical settings, is even poorer than is indicated in Table IV. Further, there appears to have been no essential change in diagnostic reliability over time (the studies summarized in Table IV were arrayed in chronological order).

#### DISCUSSIONS AND CONCLUSIONS

In spite of the obvious unreliability of psychiatric diagnosis, there exists evidence for sensitivity to and agreement on the major psychiatric



problems experienced by a patient. Gurland *et al.* (1972), in a detailed analysis of data on the patients in the U.S.-U.K. diagnostic study, found that hospital psychiatrists were sensitive to patient's psychopathology. A number of patients in the New York sample were identified by the project psychiatrists as suffering from severe depression but not from any signs of schizophrenia. The hospital psychiatrists diagnosed most of these severe depressives as schizophrenic, but treated the majority of them with anti-depressant medication or with ECT. The hospital staffs obviously recognized the depression in their patients, when it was present, but failed to incorporate that recognition into their diagnoses.

As one of its studies of diagnostic practice, the U.S.-U.K. diagnostic project showed videotape recordings of a small number of psychiatric interviews to large numbers of American, British, and Canadian psychiatrists (Copeland *et al.*, 1971; Kendell *et al.*, 1971; Sharpe *et al.*, in press). Some of the interviews gave rise to strikingly large diagnostic differences between the three countries; in one case the percentage of psychiatrists diagnosing schizophrenia ranged from 2 per cent in the British Isles to 69 per cent in the United States, the proportion for Canadian psychiatrists being intermediate. In another study, Sandifer *et al.* (1968) reported substantial diagnostic differences between American, English and Scottish psychiatrists.

The participant psychiatrists in the videotape studies also judged the presence or absence of technically described psychiatric signs and symptoms, and made ratings on the Inpatient Multidimensional Psychiatric Scales (IMPS) of Lorr *et al.* (1962), a series of 89 rating scales defined in non-technical language. As Katz *et al.* (1969) found in an earlier study, the U.S.-U.K. study found poor agreement between psychiatrists in judging the presence or absence of symptoms described in technical terms. With respect to ratings on the IMPS, however, there were striking similarities in the psychiatrists' perceptions of psychopathology. Although American psychiatrists tended to rate the presence of more severe pathology than their British and Canadian colleagues, all psychi-

atrists were in excellent agreement as to the most serious and the least serious problem areas. In other words, mean profiles across the factors of the IMPS were at different mean levels, but were effectively parallel. This parallelism obtained for each of the tapes shown, even though the profile for each tape highlighted different aspects of psychopathology.

The reliability of psychiatric diagnosis as it has been practised since at least the late 1950's is not good. It is likely that the reasons for diagnostic unreliability are the same now as when Beck *et al.* (1962) studied them. They found that a significant amount of the variability among diagnosticians was due to differences in how they elicited and evaluated the necessary information, and that an even larger amount was due to inherent weakness and ambiguities in the nomenclature. Since that time there have been two major innovations which may provide solutions to these problems.

Several investigators have developed structured interview schedules which an interviewer uses in his examination of the patient (Spitzer *et al.*, 1967b and 1970; Wing *et al.*, 1967). These techniques provide for a standardized sequence of topics, and ensure that variability among clinicians in how they conduct their interviews and in what topics they cover is kept to a minimum. For rating the pathology observed, these schedules contain precoded items which explicitly define the behaviours to be rated rather than relying on technical terms which have different meanings to different clinicians.

With respect to improving the nomenclature, the St. Louis group (Feighner *et al.*, 1972) has offered a system limited to 16 diagnoses for which they believe strong validity evidence exists, and for which specified requirements are provided. Whereas in the standard system the clinician determines to which of the various diagnostic stereotypes his patient is closest, in the St. Louis system the clinician determines whether his patient satisfies explicit criteria. For example, for a diagnosis of the depressive form of primary affective disorder the three requirements are dysphoric mood, a psychiatric illness lasting at least one month with no other pre-existing psychiatric condition, and at least

five of the following eight symptoms: poor appetite or weight loss; sleep difficulty; loss of energy; agitation or retardation; loss of interest in usual activities or decrease in sexual drive; feelings of self-reproach or guilt; complaints of or actually diminished ability to think or concentrate; and thoughts of death or suicide.

A consequence of the St. Louis approach is the necessity for an 'undiagnosed psychiatric disorder' category for those patients who do not meet any of the criteria for the specified diagnoses. In actual use, this category is applied to 20-30 per cent of newly-admitted in-patients.

These two approaches, structuring the interview and specifying all diagnostic criteria, are being merged in a series of collaborative studies on the psychobiology of the depressive disorders sponsored by the N.I.M.H. Clinical Research Branch. We are confident that this merging will result not only in improved reliability but in improved validity which is, after all our ultimate goal.

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## One Gene *vs.* Two Genes in Schizophrenia

By CAROL BUCK

Arguments about the role of heredity in schizophrenia have largely given way to arguments about the genetic mechanisms involved. Discussions of the various genetic models by leading workers in the field have been presented in recent years (Rosenthal and Kety, 1968; Kaplan, 1972). Single gene theories have prevailed, Slater's intermediate model being preferred because of its good fit with the observed risks of schizophrenia in specific categories of blood relatives (Slater and Cowie, 1971).

Karlsson proposed a two-gene model, for reasons which he set forth in some detail (1966). Although he has recently revoked his model in favour of Slater's (1973), he fails to provide data on the points which gave rise to his original objections to the single gene theory. Since Karlsson's model substitutes a second gene for the environmental and/or multigenic determinants of penetrance in Slater's model, the distinction between them is important.

Slater, in comparing his intermediate one-gene theory with Karlsson's model, said that it was a matter of taste which one prefers because it was difficult to find testable differences between the two (Slater, 1972). In my current study of a possible biological advantage among the sibs of schizophrenics I have used both Karlsson's and Slater's models to make predictions about the fertility of sibs. The nature of the predictions is not relevant here, but from the calculations that were required I believe that I have found a testable difference between the models. The difference is in the predicted frequencies of schizophrenia among the parents and sibs of schizophrenics. According to my calculations, the frequencies predicted from the two-gene model would be considerably higher than those which have been observed in genetic studies. The calculations are based on matings capable of producing a schizophrenic offspring.

### *The parameters for each model* Schizophrenic phenotype

Gene frequency

Fertility of schizophrenic (1)

Fertility of unaffected carrier of *s* (2)

Fertility of mating of 2 unaffected carriers (3)

Fertility of mating of 2 schizophrenics (4)

Fertility of mating of schizophrenic and unaffected carrier (4)

| Slater                 | Karlsson                                         |
|------------------------|--------------------------------------------------|
| $ss + (.12 \times Ss)$ | $.8 \times Sspp$                                 |
| $s = 0.03$             | $\begin{cases} s = 0.03 \\ p = 0.40 \end{cases}$ |
| 0.7                    | 0.7                                              |
| 1.05                   | 1.11                                             |
| 1.10                   | 1.23                                             |
| .49                    | .49                                              |
| .74                    | .78                                              |

(1) From Slater and Cowie (1971), applied also to Karlsson model.

(2) Derived from Moran's formula for 'a', the increased fitness of the heterozygote:  $a = \frac{l-j}{l-m} \times \left[ \frac{P}{1-2p} + m \right]$

where  $f$  = fitness of affected bearers of the *s* gene,  $m$  = penetrance in the heterozygote and  $p$  = frequency of *s* gene. For Karlsson's model,  $f$  was arbitrarily taken as 0.4, reduced from the 0.7 of the Slater model to allow for a presumed further reduction of fitness in the genotypes *ssPP* and *ssPp*, which Karlsson designated as autistic.

(3) Based upon Oakes' formula for the fertility of a mating between two hyperfertile heterozygotes (1968).

(4) My assumption, taken as the product of the fertilities of the two mating partners.



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*Expected frequency of schizophrenia in parents*

- (1) Expected number of parents of schizophrenic offspring

Sum over the various matings of: (weighted probability of mating  $\times$  probability of offspring with schizophrenic phenotype)  $\times 2$ .

The weight is the fertility of the mating.

- (2) Expected number of schizophrenic parents

Sum over matings in which one or both parents have schizophrenic genotype of: (penetrance  $\times$  no. of parents with genotype).

$$\text{Expected frequency in parents} = \frac{(2)}{(1)} \times 100$$

*Expected frequency of schizophrenia in sibs*

- (3) Expected number of couples who have produced a schizophrenic offspring = (1)  $\div 2$ .

- (4) Expected number of schizophrenic sibs

Sum over the various matings of: (expected no. of couples who have produced a schizophrenic offspring  $\times$  fertility weight  $\times$  probability of schizophrenic phenotype in the offspring).

$$\text{Expected frequency in sibs} = \frac{(4)}{(3)} \times 100$$

## THE RESULTS

% frequency of  
schizophrenia in:

|                     | Parents | Sibs |
|---------------------|---------|------|
| Expected (Slater)   | 7.8     | 9.7  |
| Expected (Karlsson) | 12.7    | 17.5 |
| Observed*           | 6.3     | 10.4 |

\*(Summary of many studies by Zerbin Ruden, cited by Karlsson, 1973.)

If the assumptions about fertility in Karlsson's model are altered, there is little difference in the predicted frequency among parents or sibs. Assuming that *SsPp* is not hyperfertile, the frequencies are 13.5 per cent and 16.7 per cent in parents and sibs respectively. Assuming a 5 per cent increase in fertility among *SsPp*, the comparable predictions are 13.1 per cent and 17.4 per cent.

## COMMENT

The frequencies of schizophrenia in the parents and sibs of schizophrenics predicted by Slater's model are appreciably closer to the observed frequencies than those derived from Karlsson's model. Slater has pointed out (1971) that the observed frequency in parents should be inflated to accommodate the fact that a person who has remained well to the age of parenthood has had only one-third of his risk period under observation. Since neither the prediction which I have made from his model nor the pooled observed risk given by Zerbin Ruden takes this into account, the good fit between them is undisturbed by this bias.

The results of my calculations justify Karlsson's rejection of his two-gene theory in favour of a single gene with modified dominance.

My calculations have assumed random mating. Such an assumption is unwarranted, but we lack an empirical basis for making adjustments to allow for assortative mating. If such adjustments could be made, many theoretical arguments from genetic models of schizophrenia would have to be revised.

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## Speech Perception in Schizophrenia

By H. C. BULL and P. H. VENABLES

Although there have been several reports of investigations of speech perception in schizophrenia (Laffal, 1961; Lawson, McGhie and Chapman, 1964) in all cases the assumption was made that the patients' difficulties arose, not from an inability to perceive the individual words, but from a deficiency in perceiving the words in a meaningful relationship to each other, as part of an organized pattern. In this study, however, instead of examining the performance of schizophrenic patients on a task involving the perception of sentences, as these earlier workers had done, we have used individual words as stimuli in a series of tests of speech perception.

Since schizophrenic patients have been reported to have raised auditory thresholds (Levine and Whitney, 1970; Emmerich and Levine, 1970) we decided to present the stimuli at various levels of intensity, and furthermore to test the auditory threshold of each subject. This was done to allow for the possibility that a poor performance on the task of speech perception could simply be a reflection of an impairment of auditory acuity.

### EXPERIMENT I

#### *Method*

The auditory acuity (air conduction measurements) of each subject was tested for each ear by the method of limits, using two tones (one 1,000 Hz, and one 500 Hz). For each tone on each ear four runs on the M.P. Audiometer B 222 DT were given in order to establish a mean.

This was followed by a test of the subject's ability to discriminate speech sounds. The subjects were asked to listen to lists of English words and to repeat each word after they had heard it. They were instructed to guess when in doubt about a word. The words were presented to both ears simultaneously through earphones. A stereo Vortexion tape-recorder was used for the presentation of the material, and the subject wore a pair of Eagle SE-1 headphones. Two

Advance Decade Attenuators were used to regulate the intensity of the stimuli in the two channels. The output was calibrated using an oscilloscope for a comparison to a continuous tone set at one KHz for the particular intensity. A Bruel and Kjaer 2203 sound level meter with a 4152 artificial ear was used for the setting of the intensity of the earphones.

The tests of speech perception were modelled on those used by Henkin and Daly (1968). There were four conditions, each consisting of the presentation of a list of 30 words. There were two lists of phonetically balanced words (from Fry the appropriate (1961) lists) and two lists of low pass filtered speech (these were phonetically balanced lists of words from which all the sounds above 500 Hz have been filtered off). A Rockland operational filter set at a high frequency cut-off of 500 Hz had a roll-off of 6 db per octave was used to obtain the lists of low pass filtered speech. The lists of low pass filtered speech were used in order to investigate the possibility that an impairment in the perception of speech might be a reflection of an impairment in the detection of sounds in the upper frequencies. If this were the case, it would be predicted that the performance of schizophrenic subjects would be similar to that of the control subjects on the lists of low pass filtered speech, but below those of the controls on the standard lists of phonetically balanced words.

One list of phonetically balanced words (PB) and one list of low pass filtered words (LPFS) were presented at an intensity of 80 db, and the other two LPFS lists were presented at 60 db (the LPFS lists were at these intensities before the speech was filtered).

There were forty-five male subjects. Thirty were schizophrenic patients (15 paranoid and 15 non-paranoid), and 15 were controls. All the subjects (experimental and control) were resident at Springfield Hospital, London, at the time of testing. None of the subjects had undergone lobotomy, and any subject who had been given ECT in the last three months, or who had been given ECT over a longer period, was excluded. None of the subjects showed evidence of gross brain damage; none of the patients were on their first admission, and most had been in hospital for a total of two years. The subjects were



classified as either experimental or control on the basis of hospital diagnosis. Only patients who had been diagnosed as schizophrenic were included in the experimental group. The consensus diagnosis of schizophrenia was obtained from several psychiatrists in conference. The subjects in the control group included patients diagnosed as suffering from depression and psychiatric nurses. Any patient whose diagnosis included reference to organicity, alcoholism or subnormality was excluded. The schizophrenic subjects were classified as paranoid or non-paranoid on the basis of (1) hospital diagnosis and (2) that in addition there was evidence of a rigid and recurring delusional system in any patient classified as paranoid; no such delusional system was present in any of the non-paranoid patients. No catatonic patients were included. There were no significant differences between the mean ages or vocabulary scores (from Set B of the Mill Hill Vocabulary Scale, Raven, 1948) of the three groups (paranoid schizophrenic, non-paranoid schizophrenic and control). All the subjects were tested for cerebral dominance by a small battery of tests (Oddy and Lobstein, 1972) and who did not show right hand dominance on all of the tests were excluded.

The order in which the four conditions (i) PB at 80 db, (ii) PB at 60 db, (iii) LPFS at 80 db, and (iv) LPFS at 60 db were given to each subject was randomized. The number of words correctly reported by each subject from each list was recorded and this score was converted into a percentage of the number

of words in the list. Practice trials were given at the beginning of each list.

### RESULTS

The mean auditory thresholds for the three groups are shown in Table I. There were no significant differences in auditory threshold between the groups to either the 1,000 Hz or the 500 Hz tone in either the right or the left ears ( $F_{2,42} = 0.826$  ns). Thus any differences found between the groups in speech perception cannot be thought to be due to differences in auditory acuity. This finding is a little surprising in view of Levine and Whitney's (1970) finding that schizophrenics have raised auditory thresholds; however, Ludwig, Wood and Downs (1962) also failed to obtain any significant differences between the auditory detection thresholds of the schizophrenic and control subjects.

The mean percentages of words perceived correctly on the tests of speech perception for the three groups are shown in Table II. There were no significant differences between the scores for the paranoid and non-paranoid groups ( $F_{1,28} = 4.08$  ns) on the PB list at 80 db. Although the score for the control group was greater than that for either of the schizo-

TABLE I  
*Experiment I: Mean auditory thresholds*

|                             |       |      | L. ear<br>1,000 Hz | R. ear<br>1,000 Hz | L. ear<br>500 Hz | R. ear<br>500 Hz |
|-----------------------------|-------|------|--------------------|--------------------|------------------|------------------|
| Paranoid schizophrenics     | ..    | Mean | 31.33              | 32.40              | 32.20            | 31.06            |
|                             |       | S.D. | 6.51               | 5.08               | 4.21             | 3.96             |
| Non-paranoid schizophrenics | ..    | Mean | 31.73              | 32.13              | 30.33            | 31.20            |
|                             |       | S.D. | 4.06               | 3.60               | 4.51             | 4.72             |
| Controls                    | .. .. | Mean | 30.20              | 29.53              | 29.52            | 31.00            |
|                             |       | S.D. | 3.63               | 4.10               | 4.56             | 4.28             |

TABLE II  
*Experiment I: Mean per cent correct on tests of speech perception*

|                             |       |  | PB<br>80 db | PB<br>60 db | LPFS<br>80 db | LPFS<br>60 db |
|-----------------------------|-------|--|-------------|-------------|---------------|---------------|
| Paranoid schizophrenics     | ..    |  | 87.53%      | 71.26%      | 62.20%        | 25.86%        |
| Non-paranoid schizophrenics | ..    |  | 83.13%      | 68.13%      | 52.80%        | 22.46%        |
| Control                     | .. .. |  | 90.46%      | 82.92%      | 72.40%        | 47.46%        |

phrenic groups, this difference did not quite reach significance ( $F_{2,42} = 3.13$  ns). The control group performed significantly better than the schizophrenic groups on all the other lists; in other words, on the PB list at 60 db ( $F_{2,42} = 8.74$ ;  $p < .01$ ), on the LPFS list at 80 db ( $F_{2,42} = 11.22$ ;  $p < .01$ ), and on the LPFS list at 60 db ( $F_{2,42} = 24.19$ ;  $p < .01$ ).

The results would seem to suggest, therefore, that schizophrenics do show an impairment in the perception of speech sounds and that this difference is more marked in the filtered rather than the unfiltered speech, also at low rather than high intensities.

Since there has been some evidence to suggest that it may be the left hemisphere that is associated with a schizophrenic illness (Flor Henry, 1969a and 1969b; Gruzelier, 1973), it was decided to carry out a further experiment to determine whether the difficulty in speech perception was associated more particularly with the right or the left hemisphere. It was also of interest to see whether varying the levels of intensity of the speech sounds would affect the hemisphere differentially.

#### EXPERIMENT II

##### Method

This was almost the same as in the previous experiment. Again there were three groups of 15 subjects (paranoid schizophrenics, non-paranoid schizophrenics, controls). All the subjects were selected according to the criteria outlined in the previous experiment, and there were no significant differences between the mean ages or vocabulary scores (from Set B of the Mill Hill Vocabulary Scale, Raven, 1948) of the different groups.

Since the tests of auditory threshold which were done in the previous experiment had revealed no

significant differences, this part of the previous experiment was not repeated. The test of auditory perception was the same as in the previous experiment and again comprised the four conditions of a list of PB words at 80 db, a list of PB words at 60 db, a list of LPFS words at 80 db and a list of LPFS words at 60 db. The word lists were exactly the same as in the previous experiment, except that instead of all the words in each list being presented to both ears simultaneously half of the words in each list (15 words) were presented to one ear and half to the other ear. Continuous white noise at 60 db intensity was fed into the ear which was not being given words for identification. This was done to reduce the effectiveness of the ipsilateral connections from the ears to the temporal lobes (Rosenzweig, 1951). In this way it was hoped that any differences which were obtained between the scores from the material presented to the left and right ears might give some indication of interhemispheric differences. The equipment used was the same as for the previous experiment, with the exception that, instead of the material to both ears coming from the tape recorder, a white noise generator, which was calibrated in the same way as the output from the tape recorder, was used to give a supply of continuous white noise to one channel.

Each subject heard 15 words in the right ear and 15 in the left ear in each of the four conditions. In each condition, for half of the subjects in each group the stimuli were presented to the right ear first, and for the other half they were presented to the left ear first. The order in which the lists were presented to each subject was randomized. Again, the number of words correctly reported for each half-list was recorded, and this score was converted into a percentage. Practice trials were given before each condition.

#### RESULTS

The mean percentages correct on the tests of speech perception for the three groups are shown on Table III. There was an overall

TABLE III  
*Experiment II: Mean per cent correct on tests of speech perception*

|                                | PB<br>80 db |        | PB<br>60 db |        | LPFS<br>80 db |        | LPFS<br>60 db |        |
|--------------------------------|-------------|--------|-------------|--------|---------------|--------|---------------|--------|
|                                | L. ear      | R. ear | L. ear      | R. ear | L. ear        | R. ear | L. ear        | R. ear |
| Paranoid schizophrenics        | 76.93%      | 77.80% | 61.27%      | 66.60% | 40.47%        | 45.32% | 26.20%        | 20.13% |
| Non-paranoid<br>schizophrenics | ..          | 74.60% | 81.27%      | 56.33% | 64.93%        | 37.37% | 41.40%        | 15.13% |
| Controls                       | ..          | 93.13% | 94.07%      | 82.67% | 82.20%        | 51.60% | 56.13%        | 38.67% |

groups difference on all the data ( $F_{2,42} = 11.54$ ;  $p < .01$ ). Although the differences between the scores from the PB lists and LPFS lists were significant ( $F_{1,42} = 533.94$ ;  $p < .01$ ), the interaction between this factor and the group factor was not ( $F_{2,42} = 0.663$  ns). Similarly, the differences in the results due to the presentation of the stimuli at two levels of intensity (80 db and 60 db) were highly significant ( $F_{1,42} = 124.44$ ;  $p < .01$ ), but the interaction between this factor and the group factor was not ( $F_{2,42} = 1.09$  ns). Again, for the differences between the scores from the stimuli presented to the right or left ears, there was an overall difference ( $F_{1,42} = 6.496$ ,  $p < .01$ ), but the interaction between this factor and the group factor was not significant ( $F_{2,42} = 2.27$  ns). Since none of the interactions between the various combinations of these factors with the groups factor were significant, it would seem that there was an overall difference between the scores from the schizophrenic and control groups which was independent of variations in intensity of the kind of speech material, and of the two ears. Since there were no significant differences between the scores from the paranoid and non-paranoid groups ( $F_{1,28} = 0.36$  ns), it would seem that on this task of speech perception the performance of both the schizophrenic groups was impaired, irrespective of the ear to which the stimuli were presented or of the experimental conditions.

These results would seem to confirm those obtained in the previous experiment, indicating that schizophrenic patients do suffer from an impairment in speech perception. There was no support, however, for the suggestion that the impairment could be associated with one hemisphere rather than the other, since although there was overall difference between the scores from the stimuli presented to the right and left ears this difference was independent of any group differences.

Since in both of the experiments on speech perception, on the lists of low pass filtered speech, the performance of the schizophrenic subjects was inferior to that of the controls, the notion that the impairment in speech perception could have arisen as a result of an impairment

in the detection of sounds in the upper frequencies must be rejected.

The fact that in both of these experiments the schizophrenic patients were shown to suffer from an impairment in speech perception means that on any task in which the perception of spoken material is involved, the performance of schizophrenics is likely to be impaired. As a result of this finding the various reports of schizophrenic impairment in many areas (for example, on information processing tasks, learning tasks and short term memory) should at least be reconsidered. The possibility that the poor results obtained by the schizophrenic patients on such tasks could simply be a reflection of an impairment in the perception of spoken material should certainly be investigated.

#### SUMMARY

An experiment is reported in which the ability of schizophrenics to perform tests of speech perception for individual words was compared to that of control subjects. The results indicate that schizophrenic patients do suffer from an impairment in the perception of individually spoken words presented at various levels of intensity. No support was obtained for the suggestion that this impairment could be associated with the presentation of stimuli to the left rather than the right cerebral hemisphere. The implications of this finding for the reports of schizophrenic impairment in many areas is considered.

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## A Hundred Cases of Suicide: Clinical Aspects

By B. BARRACLOUGH, J. BUNCH, B. NELSON and P. SAINSBURY

'It was the author's object in his paper to establish a fact he believes, of primary importance,—that the disposition to commit self-destruction is, to a great extent, amenable to those principles which regulate our treatment of ordinary diseases; and that, to a degree more than is generally supposed, it originates in derangement of the brain and abdominal viscera.'

Forbes Winslow. *The Anatomy of Suicide*, 1840.

Historically, doctors have not always acknowledged that they have an obligation to prevent suicide, partly because they shared the prevalent idea that most suicides were caused by moral crises, no concern of theirs—and indeed suicide was a criminal matter until quite recently; but more, perhaps, because a fatalism has characterized their attitudes to its prevention, even where the suicide was clearly suffering from mental illness. Yet two recent American studies have shown more than 90 per cent of suicides to be mentally ill before their death (17, 8); this finding and the familiar clinical observation that suicidal thoughts disappear when the illness is successfully treated provide a strong case for a medical policy of prevention.

We describe here the psychiatric histories of 100 suicides obtained soon after the event from their relatives, their doctors, other witnesses and medical records. Our aims were to see what proportion of suicides had been mentally ill; to determine the diagnoses; to discover how many gave warnings of their intentions, and find out their medical contacts and current treatment. Our other objectives, not dealt with here, were first to see if social factors related to the act, and second to see what stressful events preceded the suicide.

### METHOD

#### *Sampling*

One hundred suicides, defined by a coroner at inquests, and residents of the County of West Sussex or of the County Borough of Portsmouth were studied. They included two samples: 25 of 29 suicides who died in West Sussex during 1966 and 1967 comprised the first sample, and 75 consecutive suicides occurring in both areas during 1968, the

second. The sampling method excludes residents who died outside their coroner's area, and transients who came into the coroner's district and died there.

#### *Interview procedure*

After each inquest the witnesses who had been identified as those likely to know most about the suicide were visited without previous warning. We found that this procedure made acceptance likely and caused least distress. The three interviewers, a psychiatrist and two psychiatric social workers, visited the households of 43, 30 and 27 suicides respectively, and interviewed the main informant; they used a questionnaire of 252 categorized and coded items of which 130 dealt with the suicide's previous medical and psychiatric history, his physical and mental state at the time of death, and any treatment he was then receiving. The items referred to observed behaviour, objective facts and documented data. Each item of behaviour the informant was asked about had been previously defined, and covered those usually included in a routine examination of mental status. The items were categorized as present or absent, or rated as severe, mild or not present.

The interviewer was allowed considerable latitude as regards the questions put to the informant in order to elicit the information needed to code replies to the items, because rapport, and hence validity, is more readily obtained if the interview is not too rigidly structured, especially when, as in this enquiry, the informants were upset because of the bereavement.

The interviewer also recorded the supporting evidence for positively scored items; and each completed case record was reviewed item by item at a joint conference of the three interviewers. Differences in interpretation were then settled in terms of the criteria by which items were defined. Documents were frequently used to corroborate oral accounts of symptoms, present, past and family history and treatment. Psychiatric hospital notes were seen in 59 cases, general hospital notes in 34,

Ministry of Defence medical records in 7, Executive Council medical cards and post mortem reports in all cases but one; and there were 39 suicide notes.

The principal informant's relationship to the suicide also has a bearing on validity; 54 lived with the suicide, 16 visited him daily, 24 visited twice weekly and 6 visited weekly or less often. First degree relatives, that is spouse, parent, sib or child were the main informants of 83 suicides, other relatives or lifelong friends of 13 suicides, and lesser degrees of relationship of 4. Because the main informants could not give all the details, other witnesses, usually near relatives or close friends, were also seen, an average of 4.5 per case, and the evidence of expert witnesses such as pathologists, pharmacists and social workers was used where relevant. The general practitioner was interviewed by visit or by telephone in 94 cases, and medical or nursing staff of psychiatric hospitals were interviewed in 11. Exhaustive enquiries were therefore made from all relevant quarters to collect valid information.

#### *Reliability*

To ensure uniformity of coding, the three interviewers jointly reviewed each case-record item by item when it was completed. In 11 cases the informants were interviewed by two interviewers; one of the pair interrogated, while both wrote down replies and independently coded all the items. Coding differences provided a measure of reliability. No disagreements were recorded on 88 per cent of the clinical items, and one disagreement on 10 per cent. Items were also inspected for interviewer bias by examining the frequency of positive responses obtained by each interviewer for each item in all the cases. (Significant differences between them were obtained on less than 5 per cent of the items, that is to say, only as often as can be attributed to chance.) We therefore had no reason to suppose that the interviewers used differing standards.

#### *Diagnosis*

A panel of three psychiatrists independently reviewed all the evidence available on each suicide and made a diagnosis. A description of the criteria for diagnosing depressive illness was provided, namely the presence of medical symptoms, insomnia, weight loss, anorexia, behavioural signs such as depressed appearance, reduced activity and psychological symptoms of complaints of depression, listlessness, lack of interest and statements of guilt, hypochondriasis and various delusions. It was essential that an unequivocal change from the patient's usual state had been reported.

A diagnosis was given to the suicide if two of the

three psychiatrists agreed; in 18 cases more than one psychiatric diagnosis was made. The percentages of complete agreements were: mentally ill, 95 per cent ( $N = 93$ ), depression 86 per cent (80), alcoholism 87 per cent (15), abnormal personality 75 per cent (27). We concluded that the procedure provided an acceptable degree of inter-psychiatrist agreement.

To control the social and some of the clinical data, a population sample not attending for psychiatric treatment was obtained from the registers of two large general practices, one in Portsmouth and the other in West Sussex. The control group was matched with the suicide group for age, sex and whether ever married, by randomly obtaining quotas for these categories. One hundred and fifty people were interviewed with a questionnaire which covered the same ground as that for the suicides, except the symptoms section; the details of how this was done to ensure comparability with the suicides are described elsewhere (4).

#### RESULTS

The sex, age and marital status distribution and diagnostic classification of the 100 suicides will be described first, then the main clinical findings for the diagnostic groups.

#### *Sex, age and marital status*

The expected values of these characteristics for a random sample of 100 people were calculated by proportion from their distribution in the general population of the two counties (16), controlling for sex and age; the expected values were then compared with observed (Table I). The over-represented groups in the suicide sample are men; the older age groups, especially men between 45 and 64, and women over 65. Other particularly vulnerable male groups are the single, widowed and divorced and those over 25 years; single men under 25 and married men 25-44 are least at risk. For women, being single and over 45, and widowed at any age carry a high risk, while young single and young married women are less at risk. The sample resembles the national suicide statistics of England in these respects and may therefore be considered representative of suicides in general.

#### *Diagnoses*

Ninety-three of the 100 suicides were diagnosed mentally ill. The distribution of the

TABLE I  
*Distribution of sex, age and marital status*

|                                                                      |    |    | Depression |     | Alcoholism |     | Miscellaneous |     | Not mentally ill |     | All    |     | Expected |     |
|----------------------------------------------------------------------|----|----|------------|-----|------------|-----|---------------|-----|------------------|-----|--------|-----|----------|-----|
|                                                                      |    |    | N(64)      | %   | N(15)      | %   | N(14)         | %   | N(7)             | %   | N(100) | %   | N(100)   | %   |
| Men                                                                  |    |    |            |     |            |     |               |     |                  |     |        |     |          |     |
| 15-24                                                                | .. | .. | 4          | 13  | 0          | 0   | 0             | 0   | 0                | 0   | 4      | 8   | 10.2     | 19  |
| 25-44                                                                | .. | .. | 5          | 17  | 3          | 25  | 4             | 57  | 1                | 25  | 13     | 25  | 15.7     | 30  |
| 45-64                                                                | .. | .. | 16         | 53  | 9          | 75  | 0             | 0   | 1                | 25  | 26     | 49  | 17.2     | 32  |
| 65+                                                                  | .. | .. | 5          | 17  | 0          | 0   | 3             | 43  | 2                | 50  | 10     | 19  | 10.0     | 19  |
| Total                                                                | .. | .. | 30         | 100 | 12         | 100 | 7             | 100 | 4                | 100 | 53     | 101 | 53.10    | 100 |
| $\chi^2 = 8.7; p < 0.05; \text{d.f.} = 3$                            |    |    |            |     |            |     |               |     |                  |     |        |     |          |     |
| Women                                                                |    |    |            |     |            |     |               |     |                  |     |        |     |          |     |
| 15-24                                                                | .. | .. | 0          | 0   | 0          | 0   | 0             | 0   | 1                | 33  | 1      | 2   | 6.8      | 14  |
| 25-44                                                                | .. | .. | 6          | 18  | 1          | 33  | 4             | 57  | 0                | 0   | 11     | 23  | 12.4     | 26  |
| 45-64                                                                | .. | .. | 13         | 38  | 1          | 33  | 1             | 14  | 0                | 0   | 15     | 32  | 15.0     | 32  |
| 65+                                                                  | .. | .. | 15         | 44  | 1          | 33  | 2             | 29  | 2                | 67  | 20     | 43  | 12.9     | 27  |
| Total                                                                | .. | .. | 34         | 100 | 3          | 99  | 7             | 100 | 3                | 100 | 47     | 100 | 47.1     | 99  |
| $\chi^2 = 9.0; p < 0.05; \text{d.f.} = 3$                            |    |    |            |     |            |     |               |     |                  |     |        |     |          |     |
| Both sexes                                                           |    |    |            |     |            |     |               |     |                  |     |        |     |          |     |
| 15-24                                                                | .. | .. | 4          | 6   | 0          | 0   | 0             | 0   | 1                | 14  | 5      | 5   | 17       | 17  |
| 25-44                                                                | .. | .. | 11         | 17  | 4          | 27  | 8             | 57  | 1                | 14  | 24     | 24  | 28       | 28  |
| 45-64                                                                | .. | .. | 29         | 45  | 10         | 67  | 1             | 7   | 1                | 14  | 41     | 41  | 32       | 32  |
| 65+                                                                  | .. | .. | 20         | 31  | 1          | 7   | 5             | 36  | 4                | 57  | 30     | 30  | 23       | 23  |
| Total                                                                | .. | .. | 64         | 99  | 15         | 101 | 14            | 100 | 7                | 99  | 100    | 100 | 100      | 100 |
| $\chi^2 = 13.7; p < 0.01; 3 \text{ d.f.}$                            |    |    |            |     |            |     |               |     |                  |     |        |     |          |     |
| Men                                                                  |    |    |            |     |            |     |               |     |                  |     |        |     |          |     |
| Single                                                               | .. | .. | 11         | 37  | 2          | 17  | 4             | 57  | 1                | 25  | 18     | 34  | 12.6     | 24  |
| Married                                                              | .. | .. | 17         | 57  | 5          | 42  | 2             | 29  | 3                | 75  | 27     | 51  | 37.5     | 71  |
| Widowed                                                              | .. | .. | 2          | 7   | 3          | 25  | 1             | 14  | 0                | 0   | 6      | 11  | 2.83     | 5   |
| Divorced                                                             | .. | .. | 0          | 0   | 2          | 17  | 0             | 0   | 0                | 0   | 2      | 4   | 0.17†    | 0.3 |
| Total                                                                | .. | .. | 30         | 101 | 12         | 101 | 7             | 100 | 4                | 100 | 53     | 100 | 53.1     | 100 |
| $\chi^2 = 13.6; p < 0.01; 2 \text{ d.f.}$<br>† $p = 0.01$ (Poisson)  |    |    |            |     |            |     |               |     |                  |     |        |     |          |     |
| Women                                                                |    |    |            |     |            |     |               |     |                  |     |        |     |          |     |
| Single                                                               | .. | .. | 11         | 32  | 0          | 0   | 1             | 14  | 1                | 33  | 13     | 28  | 10.5     | 22  |
| Married                                                              | .. | .. | 11         | 32  | 1          | 33  | 6             | 86  | 1                | 33  | 19     | 40  | 28.1     | 59  |
| Widowed                                                              | .. | .. | 11         | 32  | 1          | 33  | 0             | 0   | 1                | 33  | 13     | 28  | 7.83     | 17  |
| Divorced                                                             | .. | .. | 1          | 3   | 1          | 33  | 0             | 0   | 0                | 0   | 2      | 4   | 0.67†    | 1.4 |
| Total                                                                | .. | .. | 34         | 99  | 3          | 99  | 7             | 100 | 3                | 99  | 47     | 100 | 47.1     | 99  |
| $\chi^2 = 8.5; p < 0.05; 2 \text{ d.f.}$<br>† $p < 0.1$ (Poisson)    |    |    |            |     |            |     |               |     |                  |     |        |     |          |     |
| Both sexes                                                           |    |    |            |     |            |     |               |     |                  |     |        |     |          |     |
| Single                                                               | .. | .. | 22         | 34  | 2          | 13  | 5             | 36  | 2                | 30  | 31     | 31  | 23.1     | 23  |
| Married                                                              | .. | .. | 28         | 44  | 6          | 40  | 8             | 57  | 4                | 57  | 46     | 46  | 65.6     | 66  |
| Widowed                                                              | .. | .. | 13         | 20  | 4          | 27  | 1             | 7   | 1                | 14  | 19     | 19  | 10.66    | 11  |
| Divorced                                                             | .. | .. | 1          | 2   | 3          | 20  | 0             | 0   | 0                | 0   | 4      | 4   | 0.84†    | 1   |
| Total                                                                | .. | .. | 64         | 100 | 15         | 100 | 14            | 100 | 7                | 101 | 100    | 100 | 100.20   | 101 |
| $\chi^2 = 20.1; p < 0.001; 2 \text{ d.f.}$<br>† $p < 0.01$ (Poisson) |    |    |            |     |            |     |               |     |                  |     |        |     |          |     |

|            |    |    | Depression |     | Alcoholism |     | Miscellaneous |     | Not mentally ill |     | All    |     | Expected |     |
|------------|----|----|------------|-----|------------|-----|---------------|-----|------------------|-----|--------|-----|----------|-----|
|            |    |    | N(64)      | %   | N(15)      | %   | N(14)         | %   | N(7)             | %   | N(100) | %   | N(100)   | %   |
| <i>Sex</i> |    |    |            |     |            |     |               |     |                  |     |        |     |          |     |
| Male       | .. | .. | 30         | 47  | 12         | 80  | 7             | 50  | 4                | 57  | 53     | 53  | 43.9     | 44  |
| Female     | .. | .. | 34         | 53  | 3          | 20  | 7             | 50  | 3                | 43  | 47     | 47  | 56.1     | 56  |
| Total      | .. | .. | 64         | 100 | 15         | 100 | 14            | 100 | 7                | 100 | 100    | 100 | 100      | 100 |

$p = 0.04$  (Binomial) one-tailed

principal diagnoses was, depressive illness 70 per cent, alcoholism 15 per cent, schizophrenia 3 per cent, phobic anxiety state 3 per cent, barbiturate dependence and schizo-affective psychosis each 1 per cent (Table II). Thus depression and

alcoholism account for 90 per cent of the suicides' diagnoses. In the remaining 7 cases the clinical information was insufficient to make a diagnosis; but in only one case (M. 14) was there no evidence of illness.

Suicide, it may be inferred, is a rare event for those with good mental and physical health; rather is it associated with depressive illness and alcoholism.

TABLE II  
*Diagnoses*

| Principal diagnosis                | Other diagnosis                                     | N   |
|------------------------------------|-----------------------------------------------------|-----|
| Depression                         | None .. ..                                          | 64  |
|                                    | Malignant terminal illness .. ..                    | 2   |
|                                    | Non-malignant terminal illness .. ..                | 2   |
|                                    | Barbiturate dependence .. ..                        | 1   |
|                                    | Dementia and barbiturate dependence .. ..           | 1   |
|                                    |                                                     | 70  |
| Alcoholism                         | None .. ..                                          | 4   |
|                                    | Depression .. ..                                    | 9   |
|                                    | Depression and non-malignant terminal illness .. .. | 1   |
|                                    | Non-malignant terminal illness .. ..                | 1   |
|                                    |                                                     | 15  |
| Schizophrenia                      | .. ..                                               | 3   |
|                                    |                                                     | 3   |
| Phobic anxiety state               | None .. ..                                          | 2   |
|                                    | Barbiturate dependence .. ..                        | 1   |
|                                    |                                                     | 3   |
| Barbiturate dependence             | .. ..                                               | 1   |
|                                    |                                                     | 1   |
| Acute (schizo-affective) psychosis | .. ..                                               | 1   |
|                                    |                                                     | 1   |
| Total mentally ill                 | .. ..                                               | 93  |
| Total not mentally ill             | .. ..                                               | 7   |
|                                    |                                                     | 100 |

#### DIAGNOSTIC GROUPS

For convenience the sample has been divided into four clinical groups: 64 uncomplicated depressive; 15 alcoholics; the remainder of the mentally ill, diagnostically heterogeneous, numbering 14, which includes the 6 depressives with other serious illnesses; and the 7 not diagnosed mentally ill.

The purpose of the description which follows is to show that the clinical evidence was sufficient to make a valid diagnosis; to see whether the suicides' diagnoses are clinically typical or have distinctive features; and to obtain clinical guides to preventive measures. Most emphasis is given to the suicides diagnosed depression and alcoholism, as they are numerically so important.

#### DEPRESSIVES

A depressive illness uncomplicated by other serious physical or mental disorder was diagnosed in 64 of the suicides; 30 (47 per cent) men and 34 (53 per cent) women. Their mean age was 54 years (S.D. 16), for men it was 50 (S.D. 16) and for women 58 (S.D. 15). Three quarters were over 45. Their marital status, when compared with the distribution in the population at



risk, showed more single and widowed, fewer married and about as many divorced as expected (Table I). A feature not brought out by comparisons with the census data is the very high proportion of married suicides who were either separated or living unhappily with their spouses.

### *Symptoms*

The frequency distribution of the suicides' symptoms of depression did not seem atypical (Table III). To test this clinical impression the incidence of the 15 leading symptoms was compared with that found in 128 consecutive cases of 'endogenous' depression, matched for age and sex, referred to the Chichester District Psychiatric Service. Their leading symptoms had been rated for severity by a consultant psychiatrist (9, 12). The rank order of the frequency of the 15 symptoms was similar, but the suicides scored consistently higher ratings for all symptoms, especially insomnia. Symptomatically, therefore, the depressed suicides resembled an unselected sample of depressives, but they appeared to be more severely depressed when assessed on symptoms. Differing interview procedures may account for the finding.

### *Past and family history*

A history of psychiatric treatment, verified by consulting the hospital notes, was the index of previous morbidity used (Table IV).

Twenty-eight (44 per cent) had a history of psychiatric treatment, and another 5 (8 per cent) a record of a psychiatric consultation only. Thus half the depressives had had a previous episode serious enough to warrant psychiatric intervention. Of the 28 previously treated suicides 26 had been diagnosed depression, 7 mania. Reliable oral evidence indicated that a further 4 had had attacks of mania, making 11 (17 per cent) cases of manic-depressive illness, a similar proportion (14 per cent) to that found in the unselected, affectively disordered patients referred to a psychiatric service in St. Louis (23). So the circular form of the illness is not apparently over-represented in suicides.

Documentary data alone underestimate morbidity, so judgements of past ill-health were also made on informants' oral evidence. These indicated that another 12 suicides had probably had previous episodes of depressive illness which had not received psychiatric treatment, making a total of 40 (63 per cent) with previous histories of depression.

Another measure of previous illness is the number of 'spells' of psychiatric treatment. A 'spell' is a period of documented psychiatric care ended by discharge or by lapse of attendance for more than three months. The range was from one to twenty spells, the mean 4.4 and the median 3.0. Thus there was a group of suicides who were depressed at the time of their death and distinguished by recurrent episodes of the same illness. We were unable to evaluate this finding by comparison with depressed patients.

A history of attempted suicide was recorded only if the hospital notes had been seen, or a witness to the attempt interviewed. Twenty one (33 per cent) of the depressed suicides had attempted suicide before; more than half during the year previous to their death, and in the course of their final illness. Eight of the 21 had made two or more attempts at suicide. Another 8 suicides had told an interviewed witness of an unobserved suicide attempt. If these are also included 29 (46 per cent) had attempted suicide before finally succeeding.

Only 6 per cent of the unselected Chichester depressives on the other hand had histories of previous suicide attempts. Thus an important distinction between the two groups is the previous tendency of those who kill themselves to think of suicide more and to act on the thought.

### *Family histories*

Histories of mental illness could be systematically collected only for first degree relatives—parents, siblings and children. A history was scored positively if the hospital notes were seen, or an interviewed relative confirmed having had a history of treatment; a psychiatric consultation only was not counted. Reports of relatives committing suicide were verified by their death certificates (Table IV).

TABLE III  
Symptoms recorded as present during four weeks previous to death, by diagnosis

| Symptoms                             | Depression<br>(N = 64)<br>% | Alcoholism<br>(N = 15)<br>% | Miscellaneous<br>(N = 14)<br>% | Not<br>mentally ill<br>(N = 7)<br>% | All<br>(N = 100)<br>% |
|--------------------------------------|-----------------------------|-----------------------------|--------------------------------|-------------------------------------|-----------------------|
| Looked miserable .. .. .             | 89                          | 40                          | 43                             | 0                                   | 69                    |
| Insomnia .. .. .                     | 86                          | 80                          | 50                             | 29                                  | 76                    |
| Taking hypnotics .. .. .             | 70                          | 73                          | 43                             | 29                                  | 64                    |
| Weight change .. .. .                | 69                          | 67                          | 57                             | 57                                  | 66                    |
| Looked anxious .. .. .               | 67                          | 53                          | 43                             | 29                                  | 60                    |
| Complained of sadness .. .. .        | 64                          | 60                          | 14                             | 14                                  | 53                    |
| Weight loss .. .. .                  | 61                          | 47                          | 43                             | 43                                  | 55                    |
| Difficulty in working .. .. .        | 61                          | 33                          | 21                             | 0                                   | 47                    |
| Reduction in work .. .. .            | 53                          | 53                          | 43                             | 0                                   | 48                    |
| Less interest .. .. .                | 53                          | 40                          | 29                             | 14                                  | 45                    |
| Pessimistic or hopeless about future | 52                          | 47                          | 21                             | 0                                   | 43                    |
| Anorexia .. .. .                     | 50                          | 60                          | 21                             | 0                                   | 44                    |
| Less social activities .. .. .       | 47                          | 27                          | 43                             | 0                                   | 40                    |
| Less energy .. .. .                  | 47                          | 33                          | 29                             | 0                                   | 39                    |
| Slower movements .. .. .             | 45                          | 40                          | 43                             | 14                                  | 42                    |
| Reproached self .. .. .              | 44                          | 40                          | 7                              | 14                                  | 36                    |
| Difficulty in concentration .. .. .  | 42                          | 33                          | 21                             | 0                                   | 35                    |
| Weeping .. .. .                      | 42                          | 60                          | 14                             | 14                                  | 39                    |
| Restless .. .. .                     | 41                          | 40                          | 14                             | 0                                   | 34                    |
| Diurnal mood variation .. .. .       | 38                          | 20                          | 43                             | 0                                   | 30                    |
| Hypochondriacal .. .. .              | 36                          | 53                          | 7                              | 14                                  | 35                    |
| Indecisive .. .. .                   | 33                          | 20                          | 7                              | 0                                   | 25                    |
| Thought self a burden .. .. .        | 33                          | 20                          | 29                             | 14                                  | 29                    |
| Slower speech .. .. .                | 31                          | 40                          | 57                             | 0                                   | 34                    |
| Useless or worthless .. .. .         | 31                          | 33                          | 14                             | 0                                   | 27                    |
| Thought let people down .. .. .      | 28                          | 27                          | 7                              | 0                                   | 23                    |
| Complained of anxiety .. .. .        | 28                          | 40                          | 43                             | 14                                  | 31                    |
| Trembling/shaking .. .. .            | 22                          | 53                          | 14                             | 0                                   | 24                    |
| Failing memory .. .. .               | 17                          | 60                          | 14                             | 0                                   | 22                    |
| Serious unfounded worries .. .. .    | 17                          | 33                          | 0                              | 0                                   | 11                    |
| Less care with appearance .. .. .    | 17                          | 0                           | 21                             | 14                                  | 20                    |
| Said thought symptoms due to cancer  | 16                          | 33                          | 7                              | 0                                   | 16                    |
| Irritability .. .. .                 | 11                          | 20                          | 14                             | 14                                  | 13                    |
| Ruminations .. .. .                  | 11                          | 13                          | 7                              | 0                                   | 10                    |
| Panic attacks .. .. .                | 11                          | 7                           | 7                              | 0                                   | 9                     |
| Delusions .. .. .                    | 9                           | 13                          | 29                             | 0                                   | 12                    |
| Specific phobias .. .. .             | 9                           | 0                           | 14                             | 0                                   | 8                     |
| Ideas of poverty .. .. .             | 9                           | 7                           | 7                              | 0                                   | 8                     |
| Weight gain .. .. .                  | 8                           | 20                          | 14                             | 14                                  | 11                    |
| Thought illness a punishment .. .. . | 8                           | 13                          | 0                              | 0                                   | 7                     |
| Hypochondriacal delusions .. .. .    | 8                           | 27                          | 0                              | 0                                   | 9                     |
| Sexual symptoms .. .. .              | 8                           | 7                           | 0                              | 14                                  | 7                     |
| Somatic anxiety symptoms .. .. .     | 8                           | 7                           | 7                              | 0                                   | 7                     |
| Changed smoking habits .. .. .       | 6                           | 0                           | 0                              | 14                                  | 5                     |
| Ideas of reference .. .. .           | 6                           | 0                           | 29                             | 0                                   | 8                     |
| Dirty .. .. .                        | 6                           | 20                          | 0                              | 14                                  | 8                     |
| Heavy drinking .. .. .               | 8                           | 100                         | 7                              | 14                                  | 22                    |
| Physical violence .. .. .            | 5                           | 7                           | 7                              | 14                                  | 6                     |
| Threatened violence .. .. .          | 5                           | 27                          | 0                              | 14                                  | 8                     |
| Depersonalization .. .. .            | 5                           | 0                           | 0                              | 0                                   | 3                     |
| Barbiturate dependence .. .. .       | 2                           | 7                           | 36                             | 0                                   | 7                     |
| Hallucinations .. .. .               | 0                           | 0                           | 21                             | 0                                   | 3                     |
| Confused .. .. .                     | 0                           | 13                          | 0                              | 0                                   | 2                     |
| Ideas of influence .. .. .           | 0                           | 0                           | 14                             | 0                                   | 2                     |
| Flattening of affect .. .. .         | 0                           | 0                           | 21                             | 0                                   | 2                     |
| Lack of volition .. .. .             | 0                           | 0                           | 21                             | 0                                   | 3                     |
| Thought disorder .. .. .             | 0                           | 0                           | 14                             | 0                                   | 2                     |
| Abnormal personality .. .. .         | 25                          | 47                          | 21                             | 14                                  | 27                    |

TABLE IV

*Past history of mental illness and attempted suicide, family history of mental illness and suicide, by diagnosis*

|                                                                                                     | Depression<br>(N = 64)<br>% | Alcoholism<br>(N = 15)<br>% | Miscellaneous<br>(N = 14)<br>% | Not<br>mentally ill<br>(N = 7)<br>% | All<br>(N = 100)<br>% |
|-----------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|--------------------------------|-------------------------------------|-----------------------|
| Past history of psychiatric treatment                                                               | 44                          | 53                          | 64                             | 14                                  | 46                    |
| Past history of depressive illness treated by psychiatrist .. ..                                    | 41                          | 40                          | 21                             | 0                                   | 35                    |
| Past history of mania treated by psychiatrist .. ..                                                 | 11                          | 0                           | 0                              | 0                                   | 7                     |
| Past history of affective disorder treated by psychiatrist .. ..                                    | 41                          | 53                          | 21                             | 0                                   | 37                    |
| Past history of alcoholism treated by psychiatrist .. ..                                            | 0                           | 53                          | 0                              | 0                                   | 8                     |
| Number of episodes of psychiatric treatment excluding present episode:                              |                             |                             |                                |                                     |                       |
| 1 .. .. .                                                                                           | 13                          | 13                          | 14                             | 14                                  | 13                    |
| 2 .. .. .                                                                                           | 6                           | 13                          | 21                             | 0                                   | 9                     |
| 3+ .. .. .                                                                                          | 25                          | 27                          | 29                             | 0                                   | 24                    |
| Probable previous episodes of depression not treated by psychiatrist                                | 48                          | 40                          | 36                             | 0                                   | 42                    |
| Probable previous episodes of other mental illness not treated by psychiatrist .. ..                | 26                          | 100                         | 7                              | 0                                   | 33                    |
| Previous history of attempted suicide                                                               | 33                          | 47                          | 7                              | 14                                  | 30                    |
| Number of previous attempts:                                                                        |                             |                             |                                |                                     |                       |
| 1 .. .. .                                                                                           | 20                          | 13                          | 7                              | 14                                  | 17                    |
| 2 .. .. .                                                                                           | 13                          | 33                          | 0                              | 0                                   | 13                    |
| Unverifiable self report of suicide attempt .. ..                                                   | 13                          | 13                          | 7                              | 0                                   | 11                    |
| No evidence of previous mental disorder or suicide attempt .. ..                                    | 23                          | 0                           | 14                             | 86                                  | 23                    |
| History of affective disorder treated by psychiatrist in parent, sib or child .. ..                 | 20                          | 27                          | 14                             | 14                                  | 20                    |
| History of suicide in parent, sib or child .. ..                                                    | 6                           | 0                           | 0                              | 0                                   | 4                     |
| No history of mental illness or attempted suicide or family history of mental illness or suicide .. | 16                          | 0                           | 7                              | 71                                  | 16                    |

Twenty per cent of the suicides diagnosed depression had first-degree relatives with histories of affective disorder; frequently more than one family member had been ill. A similar proportion of Chichester referrals had family histories of mental illness. Six per cent of cases had a history of suicide in first-degree relatives, which is the same proportion as found in the matched control group of well people.

#### *Duration of illness*

The duration of the spell of illness which preceded the suicide was less than six months in half of the cases and less than a year in two-

thirds (Table V). The illness present at the time of death could not therefore be regarded as chronic in the majority of suicides.

The duration of 'present illness' of the depressed patients referred to the Chichester psychiatric service was briefer than that of the suicides—72 per cent had been ill for less than six months at referral compared with 55 per cent of suicides. Thus, as Copes (6) inferred, suicide may tend to occur later in an episode of depressive illness.

Summarized, the main clinical findings about the 64 suicides with depression were that their symptoms and their family history of

TABLE V

(a) Age at first treatment by a psychiatrist, by diagnosis

|                                             |    |    |    | Depression<br>(N = 64)<br>% | Alcoholism<br>(N = 15)<br>% | Miscellaneous<br>(N = 14)<br>% | Not<br>mentally ill<br>(N = 7)<br>% | All<br>(N = 100)<br>% |
|---------------------------------------------|----|----|----|-----------------------------|-----------------------------|--------------------------------|-------------------------------------|-----------------------|
| Age, years:                                 |    |    |    |                             |                             |                                |                                     |                       |
| 20 or less                                  | .. | .. | .. | 5                           | 7                           | 0                              | 0                                   | 4                     |
| 21-30                                       | .. | .. | .. | 5                           | 13                          | 29                             | 0                                   | 9                     |
| 31-40                                       | .. | .. | .. | 12                          | 13                          | 36                             | 0                                   | 15                    |
| 41-50                                       | .. | .. | .. | 12                          | 27                          | 0                              | 14                                  | 13                    |
| 51-60                                       | .. | .. | .. | 8                           | 0                           | 0                              | 0                                   | 5                     |
| 61-70                                       | .. | .. | .. | 2                           | 7                           | 0                              | 0                                   | 2                     |
| 71+                                         | .. | .. | .. | 5                           | 0                           | 0                              | 0                                   | 3                     |
| Not previously treated by a<br>psychiatrist | .. | .. | .. | 50                          | 33                          | 36                             | 86                                  | 48                    |
| N.K.                                        | .. | .. | .. | 2                           | 0                           | 0                              | 0                                   | 1                     |
|                                             |    |    |    | 101                         | 100                         | 101                            | 100                                 | 100                   |

(b) Time between first treatment by a psychiatrist and death, by diagnosis

|                                             |    |    |    |     |     |     |     |     |
|---------------------------------------------|----|----|----|-----|-----|-----|-----|-----|
| Time, years:                                |    |    |    |     |     |     |     |     |
| <1                                          | .. | .. | .. | 5   | 13  | 0   | 0   | 5   |
| 1-5                                         | .. | .. | .. | 9   | 27  | 14  | 0   | 12  |
| 6-10                                        | .. | .. | .. | 11  | 7   | 14  | 0   | 10  |
| 11-20                                       | .. | .. | .. | 9   | 13  | 36  | 0   | 13  |
| 21 and over                                 | .. | .. | .. | 14  | 7   | 0   | 14  | 11  |
| Not previously treated by a<br>psychiatrist | .. | .. | .. | 50  | 33  | 36  | 86  | 48  |
| N.K.                                        | .. | .. | .. | 2   | 0   | 0   | 0   | 1   |
|                                             |    |    |    | 100 | 100 | 100 | 100 | 100 |

(c) Time between estimated onset of present psychiatric illness and death, by diagnosis

|               |    |    |    |     |      |    |     |     |
|---------------|----|----|----|-----|------|----|-----|-----|
| Time, months: |    |    |    |     |      |    |     |     |
| <3            | .. | .. | .. | 33  | 20   | 21 | 0   | 27  |
| 3-6           | .. | .. | .. | 22  | 27   | 7  | 0   | 19  |
| 7-12          | .. | .. | .. | 17  | 0    | 14 | 0   | 13  |
| 13-24         | .. | .. | .. | 16  | 13   | 0  | 0   | 12  |
| 25 and over   | .. | .. | .. | 11  | 7    | 57 | 0   | 16  |
| N.A.          | .. | .. | .. | 0   | 33   | 0  | 100 | 12  |
| N.K.          | .. | .. | .. | 2   | 0    | 0  | 0   | 1   |
|               |    |    |    | 101 | 100* | 99 | 100 | 100 |

\* Duration refers to depressive illness episodes, not alcoholism.

psychiatric treatment resembled those found in a sample of living depressives, except that a history of attempted suicide was found eight times more frequently.

#### ALCOHOLISM

The group of 15 suicides diagnosed alcoholism will be described and compared on some features

with alcoholics identified in a comprehensive survey of alcoholism in Cambridgeshire\* (15).

There were 12 men and 3 women, the same ratio (4 : 1) as was found in Cambridgeshire. So the sex of the alcoholic does not, apparently,

\* The survey aimed to identify all alcoholics aged over 15 in the County in the three-year period 1961-1964, and assess their main characteristics.

predispose to suicide. The mean age of all the alcoholic suicides was 51.3 years (S.D. 13.0); for the men it was 50.9 (S.D. 9.4) and for the women 53.0 years (S.D. 22.2). Cambridgeshire male alcoholics' mean age was 44.8 years (S.D. 14.3); they were, therefore, significantly younger than the male alcoholic suicides ( $t = 2.36$ ;  $p < 0.01$ ); the older alcoholic is the greater suicide risk. The longer alcoholism persists the more likely it is to cause the adverse personal, social and health changes which may increase risk of suicide.

Three of the 15 alcoholic suicides were divorced, seventeen times the expected number (0.18) calculated from the census. As only one of the 85 non-alcoholic suicides was divorced, compared with an expected figure of 0.66, it seems that the high suicide rate of the divorced, consistently found in suicide statistics may largely be accounted for by divorced alcoholics.

Compared with the Cambridgeshire alcoholics, the alcoholic suicides again had a high incidence of divorce and widowhood. Twenty per cent were divorced, in contrast to 6 per cent of the Cambridgeshire alcoholics, and 27 per cent were widowed as compared with 5 per cent. Thus loss of spouse may predispose the alcoholic to suicide. Such comparisons cannot show the separations, or convey the unhappy relations of those who are married and still living with their spouses, which seems to be such a special feature of alcoholic suicides.

### *Symptoms and diagnosis*

The record of drinking; the opinion of relatives and friends that it was excessive and thus beyond the norms of the suicide's cultural group; the effects on health and the social consequences of excessive drinking provided the facts for the diagnostic classification.

The more conspicuous clinical features were these:

In 80 per cent health or social functioning was seriously impaired by drinking, and one half had physical illness due to excessive drinking. The central nervous symptom had been affected at some time in nearly every case; 4 had had delirium tremens, 5 grand mal fits, and in 3 memory was permanently impaired. In three

cases a neurologist had been consulted, the complications were so severe. Alcoholic peripheral neuritis had been diagnosed in one case, hepatic cirrhosis in another, gastritis in four, and one case was in liver failure at the time of death. In half of the cases work performance had been impaired and jobs lost, in a third drunkenness had led to arrests and prosecution. Clearly they were a seriously addicted group. When the alcoholics were classified into an adaptation of Jellinek's types (21), there were 5 chronic and 5 symptomatic drinkers; 3 uncontrolled or compulsive drinkers; and 2 periodical or bout drinkers. Many depressive symptoms were recorded, and their relative incidence was similar to those of the uncomplicated depressive suicides. So extensive were the symptoms of depression that 9 of the 15 were also diagnosed depressive illness (Table III).

Without a sample of living alcoholics to compare the suicides with, conclusions about their distinguishing characteristics must be conjectural. The most obvious clinical features were the combination of severe alcohol addiction and depression occurring in a recently disturbed domestic and social setting.

### *Duration of drinking*

All had lengthy histories of heavy drinking, the mean duration being 25 years, and the range from 10 to 50 years. Such histories suggest an early start; the median age at which drinking began was 20, all but 3 beginning before thirty (Table VI).

### *Past and family history*

One half had previous histories of psychiatric treatment, usually in-patient care to control drinking on the one hand or to treat an affective disorder on the other. Multiple admissions for recurrent severe bouts of depression were recorded for a quarter; a similar finding to that for the depressive suicides (Table IV). No cases of mania were reported.

Previous suicide attempts were verified in half, and if the suicide's self-reports of past attempts are included then nearly two-thirds had attempted suicide before; one-third of them twice or more often. Of the Cambridgeshire alcoholics 40 per cent had histories of previous

TABLE VI  
*Leading features of alcoholic suicides*

|                                                                                | (N=15) | % |
|--------------------------------------------------------------------------------|--------|---|
| Heavy drinking, causing physical or mental illness, or social disability .. .. | 80     |   |
| Heavy drinking, not causing such disability .. ..                              | 20     |   |
| Informant says suicide drank too much .. ..                                    | 100    |   |
| Family says suicide drank too much .. ..                                       | 93     |   |
| Suicide said he drank too much .. ..                                           | 40     |   |
| Frequency of drinking:                                                         |        |   |
| Daily .. ..                                                                    | 67     |   |
| Two-three times weekly .. ..                                                   | 33     |   |
| Bout drinking .. ..                                                            | 80     |   |
| Illness due to drink .. ..                                                     | 47     |   |
| Trouble at work .. ..                                                          | 53     |   |
| Arrested because of drunkenness .. ..                                          | 33     |   |
| Heavy drinking at time of suicide .. ..                                        | 47     |   |
| Recent change in drinking habits:                                              |        |   |
| Increase .. ..                                                                 | 40     |   |
| Decrease .. ..                                                                 | 53     |   |
| No change .. ..                                                                | 7      |   |
| Help to stop drinking .. ..                                                    | 40     |   |
| Duration of heavy drinking (in years):                                         |        |   |
| 0-9 .. ..                                                                      | 7      |   |
| 10-19 .. ..                                                                    | 20     |   |
| 20-29 .. ..                                                                    | 40     |   |
| 30-39 .. ..                                                                    | 27     |   |
| 40-49 .. ..                                                                    | 7      |   |
| Age of onset of heavy drinking:                                                |        |   |
| 10-19 .. ..                                                                    | 33     |   |
| 20-29 .. ..                                                                    | 47     |   |
| 30-39 .. ..                                                                    | 7      |   |
| 40-49 .. ..                                                                    | 7      |   |
| 50-59 .. ..                                                                    | 0      |   |
| 60-69 .. ..                                                                    | 7      |   |

psychiatric treatment, but only 10 per cent had histories of attempts at suicide. Thus evidence of previous suicidal actions is an important distinguishing feature of the alcoholic suicide, as it is with the depressive suicide.

None of the alcoholics had a family history of treatment for alcoholism, though the relatives of 3 were said by informants to be heavy drinkers; the families of 4 (27 per cent) cases, however, had had treatment for an affective disorder.

The past and family histories of mood disorder in the alcoholic suicides resemble those of the depressives, and this observation may indicate a fundamental similarity between the two groups. Excessive drinking by depressives to control unpleasant affect has been suggested as one of the explanations for alcoholism (23). It may well be that the alcoholic especially at risk for suicide falls into that category.

To summarize the main points about the fifteen suicides diagnosed alcoholism: Alcohol addiction had led to physical damage, especially to the central nervous system, and caused serious social and domestic consequences. Depressive illness was common, its onset recent and in its clinical features similar to the depressed suicides and to the unselected living depressives. Compared with Cambridgeshire alcoholics, the suicides were older and more likely to be divorced or widowed, and histories of attempted suicide were present six times more often.

#### MISCELLANEOUS DIAGNOSES

Depressive illness and alcoholism accounted for 79 of the 93 suicides diagnosed mentally ill; the remaining fourteen with a miscellany of diagnoses will now be discussed. They were:

- |                                                                      |   |
|----------------------------------------------------------------------|---|
| (1) Advanced physical disease in association with depressive illness | 4 |
| (2) Schizophrenia                                                    | 3 |
| (3) Phobic anxiety state                                             | 3 |
| (4) Barbiturate dependence (in association with depressive illness)  | 3 |
| (5) Acute schizo-affective psychosis                                 | 1 |

The physical diseases associated with a depressive illness were: recurrent and extensive pulmonary infarction; multiple sclerosis with quadriplegia and a rodent ulcer; carcinoma of the stomach with peritoneal metastases; and carcinoma of the prostate with peritoneal metastases. The aetiological relation between mood disorder and organic disease is impossible to disentangle; the interesting but complex interaction between these two major factors is well illustrated with these two brief histories.

1. A 66-year-old retired railway engine driver lived with his wife. Throughout his adult life ups and downs of mood periodically affected his behaviour; he was at times phobic about underground travel, and outspokenly overconcerned about his health. A minor railway accident just before his retirement caused him to take a year off work, the condition being diagnosed neurasthenia by his family doctor. Shortly before his death he suffered recurrent pulmonary emboli, undiagnosed ante-mortem, with haemoptyses and dyspnoea. Then, quite suddenly, he developed a severe agitated depressive illness when he said he thought he might have lung cancer. A fortnight later he shot himself. There was no family history of mental illness.

2. A 93-year-old widower had lived alone in a seaside hotel for 15 years since his wife's death. His life had been a good one; a happy marriage, a family of successful

children, commercial prosperity in middle life, a circle of friends who liked and respected him. He had successfully coped with a series of crises—migration to the East when young, near bankruptcy in late middle age, and finally widowhood, loneliness and financial dependency. Shortly before his suicide by asphyxiation an agitated depressive illness suddenly began. At post mortem a large, spreading gastric carcinoma, undiagnosed in life, was found. A brother had a severe mental illness in middle life.

*Schizophrenia* was diagnosed three times. All three cases were young, single people, under psychiatric care whose ample clinical records substantiated the diagnosis. Two were long-term in-patients, one in a rehabilitation unit and the other in a back ward. The third was a day patient, ill some six months with her second attack, having recovered from the first two years before.

No mood disturbances were recorded nor previous attempts at suicide, nor talk of it. Each of them used a highly effective method: hanging in a little-used public lavatory; drowning, with suitcases of stones tied to the wrists; a massive aspirin overdose while living alone. The deaths were unexpected and apparently inexplicable: the assessment of suicide risk in schizophrenia may be difficult.

The three cases of *phobic anxiety state*, all youngish married people, had anxiety symptoms of such degree that their domestic and social lives had been severely affected; all required daytime sedation, and all had seen psychiatrists. The two women were dependent on barbiturates, and the man, although taking tranquillizers, drank heavily. All three killed themselves after unpleasant experiences affecting self-regard; in two it was the loss of keenly anticipated jobs, and in the third it was the loss of a boy friend. One had attempted suicide before, and another had taken a number of accidental overdoses.

The three suicides by *barbiturate addicts*, all middle-aged married women, were associated with depressive mood disorders in two and a long-standing depressive personality disorder resembling the 'Munchausen' syndrome in the third. All three were living in difficult personal circumstances, and used barbiturates to alleviate unpleasant subjective experiences. None had attempted suicide before, but one had several times taken an accidental overdose. In two

instances, the intention to die did not seem high: the act was clearly impulsive and their deaths may well have been accidents.

These six, the *phobics* and the *addicts* share many common features; persistent experiences of unpleasant anxious and depressed mood, the use of drugs to control this, and the social and interpersonal consequences of drug abuse. In these respects the resemblance to the alcoholics is close, indicating possible shared features, predisposing to suicide, and perhaps also to the depressives, some of whom also used barbiturates excessively.

The last of the fourteen, a young single man, being treated by his G.P. with protriptyline 30 mgm. daily, was diagnosed an *acute psychosis*, but had symptoms characteristic of both a schizophrenic and a depressive psychosis of great severity. After being placed under a compulsory admission order he slipped away as the ambulance door opened at the mental hospital admission bay, ran to the nearest railway track and was crushed by the next train.

#### SUICIDES NOT DIAGNOSED AS MENTALLY ILL

Seven cases were not diagnosed as mentally ill, but in only three instances were the three psychiatrists unanimous. Thus there is less confidence about this classification than about the others. The following case histories give some indication of ill health, but insufficient to make a diagnosis. An opinion can be formed therefore of the criteria used in diagnosing mental illness.

#### Case P.12

A retired nurse, single, aged 77, lived reclusively in a rented bedsitting room. No relatives or friends could be found after her death, but her landlady had taken good care of her. Physical and mental health had always been good until ten days before her death when continuous abdominal pain began, for which the general practitioner prescribed conservative treatment. The pain continued, she could not eat and lost weight. She hinted that she thought she had cancer. Arrangements were being made for her transfer to a nursing home so that her landlady could have a fortnight's holiday, but she asphyxiated herself with a plastic bag before they were completed. At post-mortem an abscess in the pouch of Douglas arising from a ruptured diverticulitis coli and consequent pelvic peritonitis was discovered.

*Case M.14*

A 21-year-old married nurse, an Asian immigrant from Tanzania, lived with her husband, her four-month-old baby and another male relative and his wife. Physical and mental health had always been good. The marriage was said to be happy; but there was some worry and unhappiness at work. She drowned herself impulsively and without warning after a brief domestic quarrel.

*Case M.26*

A 50-year-old successful married nurse lived with his wife and daughter. His past mental health had always been good. The family reported no symptoms or stresses, whereas evidence from his workmates suggested definite changes: weight loss, tenseness, irritability, not working well, not as well groomed, and hints of marital difficulties and money troubles. His death by poisoning with unprescribed barbiturates followed a sudden financial strain.

*Case M.40*

A 71-year-old single former private soldier and labourer had lived in a mental hospital for 23 years. The diagnosis on admission was an epileptic psychosis and alcoholism. A sib had been admitted to a mental hospital with epilepsy. Two years before his death he slashed his wrists in a suicide attempt. At the time of his death he was mentally and physically well, and transfer to a local authority welfare home was being arranged. On the day of his death his ward was moved and integrated with a female ward. He went out, got drunk (blood alcohol 115 mgm.%), and jumped, or fell, from a pier and quickly drowned. There was doubt in the interviewer's mind as to the verdict's correctness.

*Case M.49*

A 72-year-old childless retired civil engineer had lived with his wife in a prosperous seaside retirement suburb for sixteen years. His physical and mental health had been good until glaucoma made eye surgery necessary a year before his death. To his doctor and ophthalmologist he made remarks about future blindness, and they reassured him that his sight was not in serious danger; nevertheless he still seemed preoccupied with that thought. No other symptom or stress was recorded. He gassed himself without warning.

*Case M.58*

A 29-year-old married Anglo-Indian, a skilled tradesman, lived with his wife and two young children. Six years before his death he had a head injury resulting in 48 hours unconsciousness. A personality change followed; he became awkward and irritable, and made threats of suicide at various times. Although generally cheerful, he suffered from sudden depressive moods with associated violent behaviour, which eventually led his wife to take out a separation order. The day she did this he gassed himself while apparently depressed. Scarring of the cortex was evident at post mortem. His mother had been treated for depression after his brother had been drowned in circumstances suspicious of suicide.

*Case M.59*

A childless, widowed, medical practitioner of 65 lived alone in a flat into which she had moved two months

before death. Eight months previously she had been widowed. Her mental health had always been good, but coronary disease, which caused angina and a myocardial infarction eighteen months before death limited her activities. Bilateral labyrinthectomy for Ménière's disease affected her balance. She left notes which indicated a realistic appraisal of her future health and a dislike of living without her husband. She had spoken of suicide frequently.

## PERSONALITY

The three psychiatrists who were provided with definitions based on Schneider (19), classified 27 of the suicides as having an 'abnormal personality' (Table III); they obtained a fair measure of agreement, 20 of the 27 cases being classified unanimously. However, the reliability of an alternative classification according to personality types was too low for use.

Personality factors may play a key part in suicide. They determine not only some of the social situations associated with it, but also a person's responses to being ill and his reactions to adverse circumstances occasioned by chance. The association of illness and certain abnormalities and traits of abnormal personality may therefore affect the suicide risk. The subject is complex and will be discussed in future papers.

## WARNINGS

The proportion of suicides who can be regarded as having given warnings depends on what evidence the investigator and the informant, both with enlightened hindsight, are prepared to accept as a warning. Unequivocal statements of intention to kill shade through to ambiguous hints which may only have significance after the event. If only unquestionable threats are counted, such as that of the man who said when threatened with a court appearance, 'I will kill myself rather than appear', then 34 per cent gave such warnings (Table VII). The number of alcoholics recorded as having made an overt suicide threat was significantly higher than the number of other suicides who did so ( $\chi^2 = 4.04$ ,  $p < 0.05$ ). The reason may be that by reason of personality disorder, or because of the effects of alcohol, alcoholics are less inhibited about frightening people or manipulating them. In one third of the suicides the threat was uttered more than one month before



TABLE VII  
*Threats and warnings, by diagnosis*

|                                                      | Depression<br>(N = 64)<br>% | Alcoholism<br>(N = 15)<br>% | Miscellaneous<br>(N = 14)<br>% | Not<br>mentally ill<br>(N = 7)<br>% | All<br>(N = 100)<br>% |
|------------------------------------------------------|-----------------------------|-----------------------------|--------------------------------|-------------------------------------|-----------------------|
| Threats of suicide—time between<br>threat and death: |                             |                             |                                |                                     |                       |
| 7 days .. .. .                                       | 11                          | 27                          | 7                              | 14                                  | 13                    |
| 8–30 days .. .. .                                    | 8                           | 20                          | 7                              | 0                                   | 9                     |
| 31–365 days .. .. .                                  | 11                          | 13                          | 14                             | 14                                  | 12                    |
| No threat recorded .. .. .                           | 30<br>70                    | 60<br>40                    | 29<br>71                       | 28<br>71                            | 34<br>66              |
|                                                      | 100                         | 100                         | 100                            | 99                                  | 100                   |
| Recent talk about death, dying or<br>suicide .. .. . | 58                          | 53                          | 57                             | 29                                  | 55                    |
| No recent talk about death .. .. .                   | 42                          | 47                          | 43                             | 71                                  | 45                    |
|                                                      | 100                         | 100                         | 100                            | 100                                 | 100                   |

death, so before the thought of suicide becomes deed, there is a period of gestation when intervention may be possible.

If a less stringent definition of warning is taken, and statements such as 'You'll have my gratuity—I won't be here', or 'I'll do something stupid before that happens', are accepted as clear indications of suicidal intent, then over a half (55 per cent) gave warnings. The suicides in each diagnostic group did not vary in the extent to which they made these less obvious warnings.

The proportion of suicides recorded as having given warnings must be an underestimate, for only some of their contacts were interviewed, although these were necessarily the ones who were in a position to act—relatives, close friends and doctors. Suicide is, therefore, not always a surprise. Warnings have a preventive value in labelling the mentally ill who are likely to attempt suicide. More speculatively, they may also be useful in considering the function of such frightening talk for the potential suicide. Without entering into detailed discussion, one may see that the 'cry for help' formulation is clearly only a part of the story. Talk indicating thoughts of suicide are sometimes a statement of fact; or coercive; or may imply a mental conflict between the wish to die and the wish to live; or may indeed be a real supplication.

It should not be thought that a clear threat is a more serious predictor of suicide than an oblique hint; our findings show the reverse may be true. Both need serious attention when spoken by a depressive or by an alcoholic, especially if he has made a previous suicide attempt, and particularly if his present domestic life is in disarray.

#### MEDICAL CONTACT

The period between the suicide's last medical consultation and death was elicited by interviewing the family doctors and psychiatrists, and in most cases was verified by examining the medical record (Table VIII). Two thirds had visited their family doctor in the month before death, 40 per cent in the week before. Only 25 per cent of the control sample had seen a doctor in the previous month, and 7 per cent had done so in the previous week. Thus the suicides had recently seen a doctor, and therefore had medical contact to a far greater degree than the normal population, indicating that they either felt some need of help or perceived themselves as sick. Seventeen had not seen their family doctor for more than one year, but three of those were under psychiatric care and one was a general practitioner who treated herself.

TABLE VIII  
*Period between most recent medical contact and death, by diagnosis*

|                                          | Depression<br>(N = 64)<br>% | Alcoholism<br>(N = 15)<br>% | Miscellaneous<br>(N = 14)<br>% | Not<br>mentally ill<br>(N = 7)<br>% | All<br>(N = 100)<br>% | Controls<br>(N = 150)<br>% |
|------------------------------------------|-----------------------------|-----------------------------|--------------------------------|-------------------------------------|-----------------------|----------------------------|
| (a) <i>Family doctor</i>                 |                             |                             |                                |                                     |                       |                            |
| 0-7 days .. ..                           | 34                          | 60                          | 36                             | 43                                  | 40                    | 7                          |
| 8-30 days .. ..                          | 19                          | 13                          | 29                             | 14                                  | 19                    | 17                         |
| 31-90 days .. ..                         | 16                          | 13                          | 7                              | 14                                  | 14                    | 23                         |
| 91-365 days .. ..                        | 13                          | 7                           | 0                              | 14                                  | 10                    | 28                         |
| 366+ days .. ..                          | 17                          | 7                           | 29                             | 14                                  | 17                    | 25                         |
|                                          | 99                          | 100                         | 101                            | 99                                  | 100                   | 100                        |
| (b) <i>Psychiatrist</i>                  |                             |                             |                                |                                     |                       |                            |
| 0-7 days .. ..                           | 9                           | 27                          | 7                              | 0                                   | 11                    |                            |
| 8-30 days .. ..                          | 8                           | 0                           | 7                              | 14                                  | 7                     |                            |
| 31-90 days .. ..                         | 3                           | 7                           | 0                              | 0                                   | 3                     |                            |
| 91-365 days .. ..                        | 2                           | 0                           | 14                             | 0                                   | 3                     |                            |
| Total under psychiatric care .. ..       | 22                          | 34                          | 28                             | 14                                  | 24                    |                            |
| Not under psychiatric care .. ..         | 78                          | 67                          | 71                             | 86                                  | 76                    |                            |
|                                          | 100                         | 101                         | 99                             | 100                                 | 100                   |                            |
| (c) <i>Most recent contact of either</i> |                             |                             |                                |                                     |                       |                            |
| 0-7 days .. ..                           | 42                          | 80                          | 43                             | 43                                  | 48                    |                            |
| 8-30 days .. ..                          | 20                          | 7                           | 36                             | 29                                  | 21                    |                            |
| 31-90 days .. ..                         | 17                          | 7                           | 7                              | 14                                  | 14                    |                            |
| 91-365 days .. ..                        | 11                          | 7                           | 7                              | 14                                  | 10                    |                            |
| 366+ days .. ..                          | 9                           | 0                           | 7                              | 0                                   | 7                     |                            |
|                                          | 99                          | 101                         | 100                            | 100                                 | 100                   |                            |

A quarter of the sample were seeing a psychiatrist, and half of them had visited him in the week before death. Most were severely ill; the three cases of schizophrenia, nearly all the manic-depressives and the more difficult cases of alcoholism were those receiving psychiatric treatment. Of those not under psychiatric care, two had recently been discharged and one was in the process of compulsory admission. Recency of contact varied between diagnostic groups; 80 per cent of the alcoholics, for example, had seen either a doctor or a psychiatrist in the week before death, compared with 40 per cent of depressives.

The salient findings, then, were that the majority of suicides had recently seen their general practitioner and many were receiving psychiatric treatment, consequently there was no lack of opportunities for their suicidal in-

tentions to be recognized or for their obtaining treatment for the illnesses they have been shown to be suffering from—or, on the other hand, for obtaining the means for peaceful self destruction.

#### MEDICAL TREATMENT

We asked the subjects' doctors what treatment they had been given and also looked at their medical notes (Table IX).\*

Eighty per cent were prescribed psychotropic drugs, which implies that the suicides were recognized by their doctors as being psychologically disturbed. Hypnotics were prescribed most often, and were given to the depressives and alcoholics, and frequently for many years. All but two suicides were receiving their

\* The counselling and supportive psychotherapy given will not be assessed here; nor the provision of social care by statutory and voluntary bodies.

TABLE IX  
*Prescribed medical treatment at time of death by diagnosis*

|                                  | Depression<br>(N = 64)<br>% | Alcoholism<br>(N = 15)<br>% | Miscellaneous<br>(N = 14)<br>% | Not<br>mentally ill<br>(N = 7)<br>% | All<br>(N = 100)<br>% |
|----------------------------------|-----------------------------|-----------------------------|--------------------------------|-------------------------------------|-----------------------|
| Prescribed psychotropic drugs .. | 81                          | 87                          | 100                            | 43                                  | 82                    |
| Barbiturates .. .. .             | 53                          | 53                          | 57                             | 43                                  | 53                    |
| Antidepressants .. .. .          | 30                          | 7                           | 7                              | —                                   | 21                    |
| Phenothiazines .. .. .           | 20                          | 20                          | 36                             | —                                   | 21                    |
| Calcium carbimide (abstem) ..    | —                           | 7                           | —                              | —                                   | 1                     |
| Minor tranquillizers .. ..       | 23                          | 20                          | 21                             | —                                   | 21                    |
| ECT .. .. .                      | 5                           | —                           | 7                              | —                                   | 3                     |
| Haloperidol .. .. .              | 2                           | —                           | —                              | —                                   | 1                     |
| Hypnotics .. .. .                | 70                          | 73                          | 43                             | 29                                  | 64                    |

supplies of barbiturates from general practitioners. A detailed description of the hypnotics prescribed and their relation to the impulsive suicide has been published (3).

One third of the depressives had been prescribed antidepressants, which poses the question of why the drug did not improve the depression and prevent the suicide? A close look at the prescribing showed the following: Of the 19 depressives given antidepressants, 4 had a monoamine oxidase inhibitor (MAOI) and 15 one of the tricyclics. The four cases prescribed MAOI had severe symptoms; the drug is not found to be effective (13, 20) with this type of depression. Five of the 15 given a tricyclic had been taking the drug continuously for more than six months without any improvement in their symptoms; treatment had therefore failed. Four had been prescribed ECT, the suicide occurring at the beginning of treatment; in four others the relatives were sure the drug was not being taken; in one the drug was started the day before death; and in only one case had a tricyclic been accompanied by some improvement before death. The average dose was also well below that recommended. Thus in 9 cases the drug had failed, in 5 it had not had a fair trial, and in 4 MAOI had been given when the indication was for a tricyclic. In many cases earlier episodes of depression had been successfully treated by ECT, but it was only used in four instances in the spell that preceded the suicide. Both doctors and patients apparently dislike repeating it too often.

Antidepressant drugs had not been prescribed to any of the cases of depression with alcoholism or with physical disease; it is not known whether this was because the depression had not been diagnosed or because it was believed that depression complicated by other conditions does not respond to drugs.

Prophylaxis with lithium carbonate, unmonitored, was being given to only one case of manic-depressive psychosis; it had not yet come into wide use. Phenothiazines were used to treat the three cases of schizophrenia, but 18 other patients were also taking phenothiazines. It is possible that the drugs may have been harmful in some instances (1).

To summarize: a wide range of psychotropic drugs were prescribed, showing that the doctors had diagnosed a psychiatric disorder in most cases. One third of the depressives were given antidepressants, mostly in doses below those recommended. Barbiturates, phenothiazines and minor tranquillizers were probably overprescribed.

#### DISCUSSION

The most important of the findings is the high proportion of suicides who had been diagnosed as mentally ill. Could this finding be an artefact introduced through bias on the part of coroners, informants, interviewers or the committee of psychiatrists who made the diagnoses?

It could be argued that coroners might only bring in a verdict of suicide where there was

evidence of present or past mental illness, and allocate other suicides with clean bills of health to the Open Verdict and Accidental Death categories, thereby inflating the proportion of mentally ill suicides. This is most unlikely, because coroners, nearly all of whom are lawyers, are required to use a legal definition of suicide which relies almost exclusively on evidence of intent (11). Further, false accidental or open verdicts are appealed against by Life Insurance companies, who stand to lose by wrong decisions. And even if the coroner has evidence of a disturbed mental state he may not construe it as psychiatrists do.

The converse may also be argued, that accidental deaths with evidence of mental ill health will falsely be called suicides, again inflating the percentage of mentally ill. The constraints imposed by the legal definition of suicide, and the coroners' bias against a suicide verdict because of its social stigma, make such decisions improbable, yet in three cases this may have happened (see case M.40). But if those three are removed from the series the proportion diagnosed as mentally ill does not change. This bias is not therefore a source of overestimation of mental illness in our sample.

Relatives might inflate the proportion of mentally ill by attempting to 'explain' to themselves the reason for the suicide. Again this seems improbable; they give their statements to the coroner's officer before the inquest, when they are overwrought and less likely to dissimulate, even supposing they had the medical knowledge to do so. In fact a number of relatives firmly stated the suicide's state of mind was lucid, to the extent that the coroner's sympathetic phrase 'suicide while the balance of his mind was disturbed' angered them. And our impression during the interviews was that relatives underestimated symptoms and hence illness, partly because of difficulty in recalling the details after a month, and partly because they could only report behaviour; they were denied the subjective experiences the psychiatrist relies on when making a diagnosis.

Interviewer bias when questioning relatives and rating their replies might also have led to an overestimate of mental illness, although the interview was designed to overcome such an

error. Each item of behaviour was predefined to avoid leading questions and subjective judgements. The interviewer also had to record the supporting evidence for positively scored items, and the completed case record was reviewed item by item at a conference of the three interviewers. Differences in interpreting the replies and the criteria by which items were defined were then settled. Documentary evidence for symptoms and such items as present, past and family history and treatment was often available. And the level of agreement in the joint interviews was high and no evidence of a systematic bias was found.

The panel of psychiatrists who reviewed the data and then, without discussion, decided whether the suicide was mentally ill might have tended to make diagnosis too readily in cases of suicide, but in 93 per cent of cases they were in agreement that a mental illness was present. Their standards for making a diagnosis are illustrated in the case histories of those classified as not mentally ill, and can be regarded as on the conservative side (see p. 365). Using the common definition of depressive illness, the inter-psychiatrist agreement was 86 per cent; similarly when they were asked to confine a diagnosis of alcoholism to cases in which it was clear from their histories that alcoholism had had severe physical or social consequences, there was also an 86 per cent consensus.

Independent evidence of the validity of their diagnosis was supported by the documentary evidence, which is not subject to bias of the kind we have been considering. Half the suicides had documented reports of a previous mental illness, and if attempted suicide is included the proportion rises to two thirds. Moreover, their family histories, course and symptoms were precisely those found for an unselected sample of depressives. In addition to the psychiatrists' considered decisions based on the history and symptoms obtained from relatives, there were supporting data derived from their previous medical records and current treatment, for three quarters had attended a doctor in the previous month and over 80 per cent were taking a psychotropic drug of some kind.

Finally, it should be noted that our results resemble those obtained in St. Louis (17) and in Seattle (8). The proportions of mentally ill suicides found in those studies were 94 per cent and 100 per cent; their diagnoses were also similar; depression and alcoholism comprising the great majority—85 per cent in St. Louis and 66 per cent in Seattle. Our study, a more extensive replication of theirs, has produced a similar result, making due allowance for differences of ecology and diagnostic standpoint.

In summary, therefore, a very high proportion of suicides have been found to be mentally ill; the detailed data support the validity of the diagnoses, and possible sources of bias do not account for the findings.

Virtually all the suicides studied were therefore mentally ill; mood disorders predominating. Most of them were in contact with the medical services, received treatment with psychotropic drugs, and warnings about suicide were commonly given. These, starkly summarized, are the findings relating to the stated aims of the study. What implications then do the findings have for the causes of suicide and its prevention?

### *Causes*

Mental illness is an essential component of suicide; our findings, and those of Robins and of Dorpat suggest that in Western society suicide in the healthy person is a rare event. Yet it is obvious from follow-up studies that although depression and alcoholism, the disorders most commonly reported, are associated with high suicide rates, only a minority, about 15 per cent over a lifetime die in that way (10). Other factors must therefore be involved. Does the study indicate what they might be?

Conceivably they might arise from some special characteristic of the illness, the symptom pattern and length of illness for example, or from the type of personality and its response to illness, or from the suicide's social setting, especially isolation, or the stresses he encounters.

The incidence and pattern of symptoms appeared typical, and it was only in the history of more previous suicide attempts that de-

pressives differed from their comparison group. From which it can be inferred, obviously enough, that suicides are drawn from those depressives who have previously had suicidal thoughts and acted upon them. Such thoughts may be specific to the illness and have the form of delusions or obsessions, or they may be a response to the experience of illness determined by personality. In either case the ultimate explanation for such thinking may lie as much in the culture as in the illness, because attitudes to suicide which may come to the fore when illness supervenes, or form the content of symptoms, are acquired during social maturation.

The high proportion of suicides found to have an abnormal personality does suggest that depressives and alcoholics may be predisposed to suicide on that account. The suicidogenic effects of an abnormal personality may be those which make it difficult to sustain steady relationships; those conducing to a morbid dependency so that the individual is predisposed to depression should he become separated or bereaved; or those which generate the stressful social situations commonly found associated with suicide.

Social and interpersonal factors are clearly of great importance in suicide, and it seems likely that social stresses, particularly those affecting domestic life increase the suicide risk of depressives and alcoholics. These social stresses may be caused by the illness, or by abnormal behaviour, or they may be the result of chance and perhaps then play a part in causing the illness itself. The subject is complex and will be discussed in future papers.

### *Prevention*

What useful conclusions may be drawn about preventive measures? The very high proportion of suicides with mental illnesses of a kind usually regarded as treatable suggests that suicide could be decreased by the effective use of modern treatments. But from a practical view point such a confident appraisal might be misplaced. The findings that a high proportion of suicides had lengthy histories of treatment for recurrent or persisting illness, and that 25 per cent were having psychiatric treatment at the

time of their death, suggest that they may either have varieties of illness not amenable to existing methods of treatment and management, or that psychiatric treatment and medical services are not effectively deployed. Our findings suggest that the truth may be between the two, that some may not receive sufficiently high standards of diagnosis and care, while others are unresponsive to available methods. Recent developments in the treatment and prevention of recurrent mood disorders which seem to present an especially difficult treatment problem may have an impact on the incidence of suicide. Lithium prophylaxis may be such an advance (7).

Over 40 per cent of the sample had previous episodes of affective disorder, and a stringent analysis of the chronology of their relapses suggests that lithium might have prevented relapse, and hence suicide, in at least half of these 40 per cent (2). Prophylaxis of attacks of depression with tricyclics may similarly prove to be of value in suicide prevention (14). But there is nevertheless, likely to be a proportion inaccessible to existing methods, and in whom other methods designed to cope with chronic disability will be required. In some cases, however, there were indications that the standard methods of treating depression could have been deployed more effectively. First, only 19 of the 64 suicides with a depressive illness, and only 1 of the 19 alcoholics with depression, were receiving antidepressant drugs; none of the 6 cases with depression associated with other conditions were prescribed them. Second, the antidepressants were not effective because the type and dose were not appropriate. Third, ECT had been neglected in those with whom it had previously been successful. Fourth, barbiturates, the commonest cause of suicidal death, were liberally prescribed by general practitioners, and often repeated without seeing the patient, who either telephoned or left a note. Although it is unlikely that a determined suicide would be deterred by denying him drugs, there seem to be some who take them impulsively. Their deaths might be avoided if drugs as toxic as barbiturates were not ready to hand (3).

The emphasis has been on the clinical aspects and the medical management of the psychiatric-

ally disordered suicide, because the findings of our survey gave some clear indications that preventive measures are feasible. But that is not to say that other approaches have no place, and other studies suggest that extending psychiatric services to the community (22) may reduce the incidence of suicide in patients, and that the systematic after-care of patients suffering from conditions known to increase the risk of suicide (18) may also be effective.

### SUMMARY

One hundred suicides were investigated retrospectively by interviewing surviving relatives. Nine-three per cent were diagnosed mentally ill, 85 per cent suffering from depression or alcoholism. Eighty per cent were seeing a doctor and 80 per cent were prescribed psychotropic drugs. Over a half had given warnings of suicidal thinking. Some suicides may be preventable with modern psychiatric treatment, but our investigation showed that these methods were not always being effectively deployed.

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## Socio-Cultural Aspects of Attempted Suicide among Women in Trinidad and Tobago

By AGGREY W. BURKE

The aim of the present study is to investigate probable socio-cultural determinants in the epidemiology of attempted suicide in Trinidad and Tobago. In an earlier paper the author described the clinical features which were noted among those patients who attempted suicide and were admitted to the only psychiatric unit in these islands (Burke, 1974). During the period before this unit was in full operation other workers had noted a tendency for suicide attempts to be made more frequently by women of East Indian origin, who most often reside in rural areas, than among the more urban African ones (Haynes, 1966; Roberts and Russell, 1969). Since those studies a suicide prevention service has been established which admits all patients who attempt suicide. The present study was intended to re-investigate the ethnic sub-cultural findings which occur in the new service. It was hypothesized that there was no difference in the distribution of attempted suicide, between the two sub-cultural groups.

### THE POPULATION

Trinidad and Tobago (1,980 square miles) has a plural society (Smith, 1965), with two conflict-orientated ethnic sub-cultural groups (Despres, 1967). The population has grown rapidly since the abolition of slavery. Thus, in 1844, the then predominantly African population was 73,023. Indentured labourers, who were mainly from India, were imported to maintain sugar production, and by 1911 there were 333,552 people. Rapid growth of the mining industry (petroleum and asphalt) then attracted African workers from the neighbouring islands, so that by 1970 the population was 1,100,500. Among the 551,200 female population 35.7 per cent were of East Indian origin and 64.3 per cent were African (including mixed) or be-

longed to minority (about 4 per cent) groups (Annual Statistical Digest, 1969). The tendency has been for the latter groups to live in areas of industrial production whereas rural agricultural workers are often of East Indian origin. Unlike other West Indian countries from which there has been a marked emigration, Trinidad and Tobago has had a small loss, only dating from 1963 (Quarterly Economic Report, 1972).

### METHOD

The method used here has been described in the earlier paper on clinical aspects among the patients of the present study (Burke, 1974). It has been estimated that, following the institution of the suicide prevention service at the only psychiatric unit in the country, about half of all cases of attempted suicide which occurred were admitted to this unit. The unit is well staffed and is attached to the University General Hospital in the capital, Port of Spain; all patients who had attempted suicide and presented at this hospital were admitted to the unit.

The case notes of all the female patients admitted in the 12 month period ending 31 May 1970 were examined by the author for acts of self-poisoning and/or self injury leading to admission. The age, ethnic origin, method of the attempt, reason given for the attempt, and formal psychiatric diagnosis had been routinely recorded for each patient, by the medical staff working in the unit. This information is used in the analysis which follows. Those patients who had two parents of East Indian origin formed the East Indian group; all other patients formed the 'African' group.

### RESULTS

During the one year period 90 female patients were admitted to the unit. It is of particular



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5. *Ibid.* (1973), 122, 566.
6. *Curr. Med. Res. and Opin.* (1974), 2, 78-89. Each Fluanxol tablet contains 0.5 mg. flupenthixol as the dihydrochloride. Full information is available on request.

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interest that the 35 East Indian and 55 African cases represent rates of attempted suicide admitted to the unit per 100,000 female population of 17.8 and 15.5 respectively. The total rate is 16.3.

Table I shows the diagnostic distribution. It is noteworthy that one third of the patients could not be diagnosed formally. The distribution of these patients is similar for the two

TABLE I  
*Distribution of attempted suicides: Diagnosis and ethnic group*

|                         | East Indian (%) | African (%) | Total (%) |
|-------------------------|-----------------|-------------|-----------|
| Affective disorder ..   | 19 (54)         | 24 (43)     | 43 (48)   |
| Primary ..              | 0 (0)           | 3 (5)       | 3 (3)     |
| Reactive ..             | 19 (54)         | 21 (38)     | 40 (45)   |
| Schizophrenia ..        | 1 (3)           | 2 (4)       | 3 (3)     |
| Psychoneurosis ..       | 3 (8)           | 1 (2)       | 4 (4)     |
| Personality disorder .. | 1 (3)           | 9 (16)      | 10 (11)   |
| Other diagnoses ..      | 1 (3)           | 0 (0)       | 1 (1)     |
| All diagnoses ..        | 25 (71)         | 36 (65)     | 61 (67)   |
| No diagnosis ..         | 10 (29)         | 19 (35)     | 29 (32)   |
| Totals ..               | 35 (100)        | 55 (100)    | 90 (99)   |
| Totals (expected)*      | 32              | 58          | 90        |

Diagnosis (affective : other) *vs* ethnic origin:

$$\chi^2 = 0.99 \text{ n.s.}$$

Diagnosis (no : all) *vs* ethnic origin:

$$\chi^2 = 0.37 \text{ n.s.}$$

\* From Annual Statistical Digest, 1969.

ethnic groups. Affective disorders predominate among diagnosed patients of both ethnic groups. Though few patients are diagnosed psychoneurotic or personality disorder, there is a tendency to do so for East Indian and African patients respectively. It would seem therefore that psychoneurotic and/or reactive symptomatology (psychoneurosis and reactive depression) are more frequently noted among East Indian patients, whereas more severe forms of psychopathology (all other formal psychiatric diagnoses) are identified among Africans ( $\chi^2 = 5.31$ ;  $p < .05$ ).

Table II shows the age distribution. There are few (5.5 per cent) patients older than 44. In the age group 10-24 there are more Africans and fewer East Indians, whereas at an older age the

TABLE II  
*Distribution of attempted suicides: Age and ethnic group*

|           | East Indian (%) | African (%) | Total (%) |
|-----------|-----------------|-------------|-----------|
| 10-24 ..  | 15 (43)         | 41 (75)     | 56 (62)   |
| 25+ ..    | 20 (57)         | 14 (25)     | 34 (38)   |
| Totals .. | 35 (100)        | 55 (100)    | 90 (100)  |

$$\chi^2 = 9.188; p < .01$$

converse is true. Thus though similar rates of attempted suicide were found among the ethnic sub-cultural groups, significant differences in their age distribution exist.

In the earlier paper it had been shown that formal psychiatric diagnosis was associated with age greater than 25 years of age. It is therefore of interest here that this association is upheld among East Indian patients ( $\chi^2 = 10.07$ ;  $p < .01$ ) but not among African ones ( $\chi^2 = 0.71$ ). Although African patients were often younger, the therapists had no more difficulty in diagnosing their illnesses than they had among the older East Indians.

Only four African patients were admitted as a result of self-injury methods. Among the other 86 patients (Table III) more swallowed medi-

TABLE III  
*Distribution of self-poisoning: Method used and ethnic group*

|                        | East Indian (%) | African (%) | Total (%) |
|------------------------|-----------------|-------------|-----------|
| Tablets ..             | 17 (49)         | 34 (67)     | 51 (59)   |
| Domestic substances .. | 18 (51)         | 17 (33)     | 35 (41)   |
| Totals ..              | 35 (100)        | 51 (100)    | 86 (100)  |

$$\chi^2 = 2.81; \text{ n.s.}$$

cinal tablets than a domestic agent (e.g. bleach, disinfectant, insecticide). The greater use of domestic agents among East Indians contrasts with that of tablets among Africans, but this difference is not statistically significant. An interpersonal dispute preceded the attempt at suicide as frequently among East Indian patients (77 per cent) as it did among African ones (73

per cent). Thus, though these patients employ different methods in making the attempt, the reasons they give are similarly distributed.

#### DISCUSSION

The limited facilities, ease of access to them, and the small population which is not at present undergoing much change by migration, have facilitated this investigation of socio-cultural determinants of attempted suicide. Though attempted suicide was as prevalent among the two sub-cultural groups, African patients were often younger than 25, whereas East Indian ones were older.

Clearly defined sub-cultural groups occur in few societies. Our finding of an equal distribution of attempted suicide among the East Indians and Africans is therefore worthy of note. Before the policy of admitting all attempted suicides to the suicide prevention service, it is likely that many of the less severe cases of attempted suicide, who are not diagnosed, were not admitted to in-patient care. In the present study there are more African patients in this age group than East Indian ones. When the earlier studies were made, fewer Africans would have been admitted, and accordingly a higher prevalence of attempted suicide among East Indians was found (Haynes, 1966; Roberts and Russell, 1969). As in the present study, no difference in the ethnic distribution was found among patients who attempt suicide in New Haven, but the rates there were higher (Weissman *et al.*, 1973) than we found. The geographical distribution of the population in Trinidad and Tobago suggests that the more rural East Indian may have greater difficulty in reaching the psychiatric unit than the more urban African resident. The small size of the country and its well developed road transport system are likely to reduce this probable source of error. Furthermore, the East Indian population tend to over-utilize medical services (Beaubrun, 1967), and they do not regard attempted suicide as deviant behaviour, in contrast to that attitude among Africans (Roberts and Russell, 1969). It appears to us that the prevalence of attempted suicide among the residents in a society is an index of socio-economic changes there. Social integrative

forces within sub-cultural groups are probably more evident among younger and older age groups.

In spite of the significant difference in the age distribution of East Indian and African patients they had a similar distribution of psychiatric predisposing factors, indexed by the formal diagnosis of affective disorder and of precipitating ones, indexed by the preceding interpersonal dispute. The age group finding may therefore indicate that social change has a differential effect on the ethnic sub-cultural groups and is aetiological in suicidal behaviour. Throughout the West Indies social change is characterized by increasing urbanization, lessened reliance on agriculture, population growth, unemployment and seasonal employment. Furthermore, in the few areas like Trinidad and Tobago which have a plural society, it is inevitable that internal mobility from traditional rural areas will be stressful. The findings among East Indian patients support this view.

It is worthy of note that in Philadelphia attempted suicide among Non-White female patients was more prevalent than among White ones at all ages up to 34 years, after which the reverse was found (Tuckman *et al.*, 1962). Hendin (1969) made similar observations in New York, and concluded that his black patients dramatized the pressures and conflicts and reflected the frustration and anger of the black ghetto. Though ghetto conditions may be less obvious in Trinidad and Tobago, the historical similarities of slavery in the two areas is striking. There is little doubt that the major effect of slavery was disruption of African family and community life with resultant social disintegration. Re-integration of family and community life may indeed be one way to prevent suicide attempts.

The greater number of older than younger patients among East Indians suggest that social stress and protection may be more important at these respective ages. Social protection results from their strong integrative sub-cultural and religious institutions. Although this protection may be less important at 25-44 years of age, it may however be present at a later age once more. The relative absence of older patients is

also found among Africans. This indicates that the extended family pattern which is common to both groups may be protective among these older patients.

Socio-cultural factors may have also contributed to the presentation of reactive symptomatology and to the utilization of domestic agents among East Indian patients. It is probable that in both instances the more rural habitat of these patients was the predisposing factor. This did not, however, lead to a lower rate of attempted suicide than in Hong Kong (Yap, 1958), suggesting that the ease of access to the unit in Trinidad and Tobago may not have existed in Hong Kong. Further investigations in other societies are indicated.

#### SUMMARY

This study describes the distribution of female attempted suicide among the East Indian and African populations in Trinidad and Tobago. The main findings were:

1. A similar attempted suicide rate among all persons in each sub-cultural group.
2. A difference in the age group distribution among them. East Indians were older (25 and over) and Africans younger (10-24).
3. In making the attempt East Indians swallowed domestic substances more often than Africans, though both groups gave similar reasons for their actions.

The findings support the view that socio-cultural factors are important determinants of attempted suicide.

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## Genetic Factors in Puerperal Psychosis

By INGA THUWE

Nearly all the authors who have concerned themselves with puerperal psychoses have discussed the occurrence of mental illness in the families of the patients. However, as Jansson (1964) has pointed out, there exists no systematic study on the importance of hereditary factors in this disorder.

The present investigation is an attempt at such a systematic study on the frequency of mental morbidity in children and grandchildren of women who have been under treatment for puerperal psychosis.

### REVIEW OF THE LITERATURE

Quite apart from any basic aetiological conception, the majority of authors consider that there must be various predisposing factors in those women who develop a psychosis in relation to childbirth. In this context it is usual for mental illness in the families of the patients to be discussed, and nearly all the papers include some data on heredity.

It is, however, unusual to find any information given as to how the data were obtained or how the term 'mental illness' was defined. In some cases the authors appear to be considering only psychoses; in others certain milder forms of disturbance are included, occasionally also alcoholism and epilepsy. In view of the uncertainty attaching to such statements about family history obtained from case-records or interviews, Seager (1960) considers that only such data as hospital admission or suicide should be accorded any value for studies on heredity. In many cases also, no information is given as to which relatives have been included; most authors appear to confine themselves to parents and siblings.

In view of the often incomplete information as to the significance of such terms as 'family' and 'mental illness', and also as to how the material was assembled, many of the frequency figures

for family morbidity found in the literature are difficult to evaluate.

The occurrence of mental illness in the family is sometimes expressed by the term 'positive heredity' and the frequency is represented as a percentage, implying that this proportion of the patients investigated have cases of mental illness in their families. The highest proportion encountered was 65 per cent in a material of 65 women admitted to a mental hospital in Sweden for psychosis or psychoneurosis originating within a period of 6 weeks *post partum* during the years 1943-1954 (Osterman, 1963). Frequencies around 30 per cent are common (Cruickshank, 1940; McNair, 1952; Seager, 1960; Mentzos, 1968; Huhn and Drenk, 1973).

A number of authors report differences in respect of positive heredity in different diagnostic groups of puerperal psychoses. These differences tend to show that heredity plays little part in conditions with the clinical picture of delirium and confusion—usually termed 'exogenous'—while it has greater importance in conditions regarded as schizophrenia or manic-depressive psychosis. In evaluating these results, however, it is well to bear in mind that the diagnostic criteria vary widely and that the materials are often much too small to allow statistically reliable conclusions.

Cruickshank (1940) found 22 per cent with positive heredity among 32 patients considered to show toxic pictures, as against 42 per cent among 28 patients diagnosed as manic-depressives. However, Polonio and Figueiredo (1955) reported a frequency as high as 52 per cent in a material comprising 118 cases of pregnancy psychosis and puerperal psychosis showing confusion, hallucinosis and psychomotor instability, with swings between mania and depression. According to the authors, these represent conditions of so-called exogenous type.

To judge from the symptomatology, the group of psychoses on which Polonio and Figueiredo based their conclusions bears close resemblance to Leonhard's 'cycloid psychosis'. Kaij (1967) and Wålinder (1971) studied this form of psychosis, among other things from the hereditary point of view. They both found that systematic study of these patients' families brings to light a very large accumulation of similar psychoses. They found also that attacks of such illness often occur precisely in relation to the puerperium and infection, and it therefore seems reasonable to assume that a not inconsiderable number of cases of this type of psychosis figure in clinical material representing puerperal psychoses. Polonio and Figueiredo also consider the possibility that the group of puerperal psychoses which they clinically described as exogenous are in fact clearly endogenous.

Mentzos (1968) takes the view that apart from pure manic-depressive psychoses, unipolar or bipolar, the puerperal psychoses can hardly be distinguished phenomenologically from the psychoses 'which have been described by the Kleist-Leonhard school as cycloid anxiety-, euphoria-, motility- and confusional psychoses'. Mentzos found that women with this form of puerperal psychosis, either before the illness or later in life, often show undeniably endogenous depressive, manic or mixed manic and depressive pictures.

Table 1 shows the frequency of positive heredity in different published materials of puerperal psychosis.

#### MATERIAL

In order to throw some light on the importance of the hereditary factor in puerperal psychosis, the author has utilized a material consisting of puerperal psychoses observed during the period 1872-1926. The occurrence of mental illness among all the children and grandchildren of these women has been systematically charted and compared with the findings in a control material selected in a particular way from public registration sources.

There are two main reasons for selecting the material from a period lying so far back in time. The most important one is the necessity to secure a sufficiently long observation period for

the two succeeding generations. A second reason was purely practical. During the period from which this material was taken, the hospital in question—Göteborg Mental Hospital—and the Göteborg Mental Asylum (serving the area from 1909 to 1933) maintained case-records with remarkably detailed notes covering, among other things, 'causes of the disease'. Under this heading were entered all conceivable external events occurring in the patient's life for a considerable period before the onset of the illness. The meticulous recording of detail in these notes makes it possible to feel sure that such an important event as the birth of a child would never have been overlooked. It was therefore relatively easy to obtain from these case-records a really complete material of puerperal psychoses. All case-notes in which childbirth was recorded among the 'causes of the disease' have been examined, and every patient who satisfied the undermentioned criteria was included in the material of this investigation.

#### *Initial material*

This comprised all the women who were admitted to Göteborg Mental Hospital during the period 1872-1909 and to Göteborg Mental Asylum during the period 1909-1926 and who satisfied the following criteria:

- (1) They were suffering the first attack of the illness.
- (2) The illness had originated within a period of six weeks *post partum*.

We found 48 women who satisfied these criteria with certainty. One of them proved impossible to trace in the population register and therefore had to be excluded. The number followed up was therefore 47, and these represent the *initial material* of the investigation. The *mean age* at delivery was 29 years, the median figure 30 years. *Parity*: 22 were primiparae, 14 were II-parae and 11 were III-VII-parae. *Evidence of infection* was present in 3. *Symptomatology*: Depression occurred in 26 women, mania in 6 and mixed depressive and manic mood phases in 15. Confusion occurred in 35 cases, hallucinosis in 30 and paranoid symptoms in 17. *Outcome*: Never recovered: 6 (14 per cent). Discharged well: 38 (86 per cent). Never subsequently

under treatment: 23 (52 per cent). Subsequent attacks, not followed by recovery: 7 (16 per cent). Subsequent attacks, followed by recovery: 7 (16 per cent). Suicide: 1. (Three women are not included in this account as they died after

a relatively short period of treatment.) The *duration of treatment* for those who were discharged well varies from 2 weeks to 5 years; mean figure: 11 months, median figure: 7 months. *Later attacks*: Of the 14 women who later had

TABLE I  
*Frequency of 'positive heredity' in different published materials of puerperal psychoses*

| Author<br>Year                   | Size of<br>material<br>No. | Frequency<br>% | Composition of<br>material<br>Time period                                                                        | 'Relatives'                                         | 'Positive heredity'                                                         |
|----------------------------------|----------------------------|----------------|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------------|
| Jolly (1911) ..                  | 79                         | 49             | Psychosis during<br>preg., puerp. and<br>laction (1877-1900)                                                     | ?                                                   | Psychosis<br>Psychopathy<br>Neurosis<br>Suicide<br>Alcoholism               |
| Cruickshank (1940) ..            | 84                         | 32             | Psychosis during<br>preg. and puerp.<br>(1930-1940)                                                              | ?                                                   | Psychosis<br>Neurosis<br>Epilepsy<br>Chron. alcoholism                      |
| „                                | 32                         | 22             | Ditto but only<br>'toxic' pictures                                                                               | ?                                                   |                                                                             |
| „                                | 28                         | 42             | Ditto but only<br>'manic-depressive'<br>symptomatol.                                                             | ?                                                   |                                                                             |
| Skottowe (1942) ..               | 26                         | 50             | Psychosis during<br>preg. and puerp.<br>(1936-1940)                                                              | Parents, siblings,<br>mat. and pat.<br>grandparents | Psychosis                                                                   |
| McNair (1952) ..                 | 34                         | 33             | Psychosis 'immed.<br>pst. partum.'<br>First attack.<br>Excl. cases c preg.<br>toxaemia<br>(1944-1951)            | ?                                                   | Psychosis<br>Suicide<br>Alcoholism                                          |
| Polonio and<br>Figueiredo (1955) | 118                        | 52             | Psychosis during<br>preg. and puerp.<br>but only cases c<br>toxic-delir. picture.<br>First attack<br>(1930-1953) | ?                                                   | Psychosis<br>Psychopathy<br>Epilepsy                                        |
| Seager (1960) ..                 | 42                         | 26             | Psychosis and<br>neuros. onset<br>within 2 mos.<br>post-partum<br>1953-1959)                                     | Parents, siblings                                   | 'Mental illness'<br>(probably =<br>hosp. adm.<br>+ suicide)                 |
| Osterman (1963) ..               | 65                         | 65             | Psychosis and<br>neurosis adm.<br>mental hosp.<br>Onset within<br>6 wks. p.p.<br>(1943-1954)                     | Parents, siblings,<br>mat. and pat.<br>grandparents | Psychosis<br>Neurosis<br>Suicide<br>Alcoholism                              |
| Huhn and Drenk<br>(1973)         | 208                        | 32             | Psychosis, first<br>attack, within<br>3 mos. post-<br>partum (1923-?)                                            | ?                                                   | ?<br>(94% of the<br>affected<br>relatives had<br>'endogenous<br>psychoses') |



fresh attacks, one relapsed (twice) in relation to childbirth and one at the end of a new pregnancy. Influenza preceded relapse in one other woman. In the remaining 11 women the subsequent attacks had no relation to pregnancy, delivery or infection. In all these cases the clinical picture in later attacks had been similar to that in the puerperal psychosis, in several instances identical. The number of attacks varied from one to about 50. The interval between the puerperal psychosis and the next subsequent attack varied from 9 months to 43 years, the median figure being 11 years.

#### *Proband Material*

- I. All the children of the women, total 148 ('Child generation').
- II. All the grandchildren of the women, total 190 ('Grandchild generation').

It was possible to study the occurrence of mental illness only for those in the proband material who had attained the age of 15 years, i.e. for 120 children and 173 grandchildren.

Of the 28 children who died before the age of 15 years, nearly all died in infancy. Of those who died, 17 were born at the delivery in association with which their mothers became ill. Of the women in the initial material, 4 did not have any child who reached the age of 15 years, and the 120 children investigated therefore represent 43 women. A further 9 women in the initial material did not have any grandchild who reached the age of 15 years; the 173 grandchildren therefore represent 34 women.

The 43 women had an average of 2.8 children aged over 15 years; the number per woman varies from 1 to 8, median figure 2.

The 34 women with grandchildren aged over 15 years had an average of 5.1 grandchildren; the number per woman varies from 1 to 20, median figure 3.

#### *Control material*

For every child and grandchild who attained the age of at least 15 years a control person was selected on the following basis. The control persons should have an observation period (life duration) differing as little as possible from that of the probands. Moreover, they should correspond as far as possible in respect both of place

of birth and current (or last) place of residence. This is to prevent any significant influence on the results from two factors: (1) residential mobility, and (2) the nature of the environment, whether urban or rural.

The control material was selected in two ways:

(1) For those probands (241 in number) who were living (in Sweden) in 1971, or who had died at the earliest in 1961, the controls were collected from the members' registers of the compulsory public insurance funds according to the following principles:

- (a) Belonging to the same insurance fund as the proband (i.e. in practice, living in the same place);
- (b) Having a date of birth as near as possible to that of the proband (maximum age-difference 1 year), and if the proband had died then dying in the same year;
- (c) Being of the same sex;
- (d) If possible, having the same place of birth.

(2) When it was not possible to select control persons from the insurance fund registers (i.e. for certain probands who had died or emigrated), the controls were selected from the birth registers in the communities where the probands were born (52 probands). For this, the person of the same sex, also having attained the age of 15 years, whose entry in the birth register was nearest after that of the proband was taken as the control.

*Agreement between probands and controls in respect of the stated background factors.*

For the controls selected by method (1) above, it was possible to satisfy criteria (a), (b), (c) (place of residence, age, sex) in all cases and (d) (place of birth) in the majority. In the case of the controls selected by method (2) above, there were differences in observation-period as follows: In the child-generation, 28 probands had shorter observation-periods (on average 32 years shorter) and 13 had longer ones (on average 24 years longer) than the corresponding controls. In the grandchild generation, 10 probands had shorter observation-periods (on average 24 years shorter) and 1 had a longer one (6 years longer) than the corresponding controls. In the child generation, the combined total

observation-years (and therefore years at risk) of the controls exceeded those of the probands by 592 years. In the grandchild generation the excess of combined observation-years for the controls was 235 years. The factor of *residential mobility* could not be taken into account in the controls selected by method (2), above.

#### METHOD OF INVESTIGATION

By means of the *population register*, all persons in the initial material, the proband material and the control material were followed from the community where they were registered at the age of 15 years (for some of them, from the community where they were born) to the community where they died or emigrated or, in the case of those still living in 1971, to the community in which they were registered at that time.

In this way information was obtained, among other things, about *all places of residence* and about

*all the children* of the women in the initial material and of the child generation in the proband material. When any one of these persons had died, information was obtained as to the *cause of death*.

Contact was made with all the psychiatric hospitals and out-patient centres serving the areas in which the persons of the investigation material (initial cases, probands and controls) had lived at any time after reaching the age of 15 years. Enquiries were made at these institutions as to whether any of these persons were known there, and if so the relevant case-records were borrowed for examination. Using the information in these case-records, the illnesses were classified into different categories as shown in Table II.

It was not possible to get any information about possible psychiatric consultations with private doctors. However, by making use of the member-registers of the public insurance funds

TABLE II  
*Occurrence of mental illness in children and grandchildren of women who had suffered from puerperal psychosis, and .  
in controls*

|                                                                                                           | Child<br>generation<br>No. 120 | Con-<br>trols<br>No. 120 | p     | Grandchild<br>generation<br>No. 173 | Con-<br>trols<br>No. 173 | p    |
|-----------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------|-------|-------------------------------------|--------------------------|------|
| 1. Mental hospital care .. ..                                                                             | 13                             | 3                        | <0.02 | 13                                  | 7                        | n.s. |
| 2. Psychotic reactions among these ..                                                                     | 12                             | 2                        | <0.02 | 8                                   | 2                        | n.s. |
| 3. Psychiatric clinic care (at general<br>hospital) .. ..                                                 | 2                              | 3                        | n.s.  | 2                                   | 5                        | n.s. |
| 4. Psychotic reactions among these ..                                                                     | 0                              | 0                        | n.s.  | 1                                   | 2                        | n.s. |
| 5. Total receiving mental hospital or<br>psychiatric clinic care .. ..                                    | 15                             | 6                        | n.s.  | 15                                  | 12                       | n.s. |
| 6. Total of psychotic reactions .. ..                                                                     | 12                             | 2                        | <0.02 | 9                                   | 4                        | n.s. |
| 7. Out-patient care .. ..                                                                                 | 9                              | 2                        | n.s.  | 11                                  | 7                        | n.s. |
| 8. Total receiving mental hospital, clinic<br>or out-patient care .. ..                                   | 24                             | 8                        | <0.01 | 26                                  | 19                       | n.s. |
| 9. Suicide, not known to any mental<br>hospital, never certified sick because<br>of mental illness .. ..  | 1                              | 0                        | n.s.  | 0                                   | 0                        | n.s. |
| 10. Certified for 60 days or more because<br>of mental illness, not known to any<br>mental hospital .. .. | 3                              | 1                        | n.s.  | 3                                   | 2                        | n.s. |
| 11. Total receiving care+suicide+sick<br>certification as above .. ..                                     | 28                             | 9                        | <0.01 | 29                                  | 21                       | n.s. |

#### Remarks

Each individual is entered under the 'most substantial' form of care known to have been received. For example, one who has received out-patient, clinic and hospital care has been entered in the table only under the heading 'mental hospital care'.

No. 10 above: In this group are included those who by reason of mental illness have been certified sick for at least 60 days and have had one continuous period of sick certification of at least 30 days.

a certain amount of complementary information was obtained for a large part of the material. This applies to probands and controls who were still living (in Sweden) in 1971 or who died at the earliest in 1961 (the insurance record cards are retained for a maximum of 10 years). The cards show, among other things, which members had been certified sick for mental illness from 1955 onwards (registration began in that year).

#### STATISTICAL METHODS

The differences which emerged between probands and controls were subjected to statistical significance tests by the  $\chi^2$  method with Yates' correction.

Using the Weinberg Proband Method (Slater and Cowie, 1971) a calculation was also made of the 'risk figures' for the probands and the controls. These figures express the risk of being either admitted to hospital for mental disorder or registered in any way as mentally ill (Table III).

#### RESULTS

Table II shows that there are statistically significant differences in respect of *mental morbidity* between the probands and the controls in the *child generation*. For example, 13 probands were admitted to mental hospitals as against only 3 among the controls ( $p < 0.02$ ). Twelve of the probands, but only 2 of the controls, were treated for psychosis ( $0.02 < p < 0.01$ ). The probands thus show a significantly higher recorded mental morbidity than the controls, despite the fact—pointed out in the section on control material—that the mean observation period of the probands is shorter than that of the controls in that part of the material not matched for age. If all the data in Table II

indicating mental illness are combined into one group, the number on the proband side is 28 and on the control side 9 ( $0.01 < p < 0.001$ ).

The 12 *psychoses in the child generation* (including one puerperal psychosis) are distributed among 8 sets of siblings. Two families had two affected children each, and one family had three affected children.

All the cases of mental illness in the *child generation* (total 28) represent 20 of the 43 women whose children reached adult age. Three families had two affected children, one family had three and one had four. The remaining 15 women each had one child with mental illness.

Over and above the 28 affected children, these 20 mothers together had 39 unaffected children who reached adult age.

The 23 women without any affected child together had 53 adult children.

The *grandchild generation* showed no statistically significant differences, but here too the tendency was for the proband group to receive psychiatric care to a greater extent than the control group.

The 9 *psychoses in the grandchild generation* represent 6 women in the initial material. In two families two cousins were affected, in one other family three.

All the cases of mental illness in the *grandchild generation* (total 29) represent 11 of the 34 women in the initial material who had grandchildren reaching adult age.

When the results of the study are expressed in the form usual in the literature—the frequency of positive heredity—the figure is 47 per cent if only children are taken into account and 58 per cent if grandchildren are added. It is therefore found that among women (with adult children) who have been under treatment for

TABLE III

*Probands in child generation and grandchild generation and corresponding controls*  
Risk, either of being registered in some way as suffering from mental illness or of being admitted to a psychiatric hospital  
Calculation made according to the Weinberg Proband Method (Slater and Cowie, 1971)

| Generation                | Some form of registration |           | Admission to hospital |           |
|---------------------------|---------------------------|-----------|-----------------------|-----------|
|                           | Probands                  | Controls  | Probands              | Controls  |
| Child generation . .      | 37.0±7.5%                 | 13.6±5.2% | 25.3±7.5%             | 11.1±5.0% |
| Grandchild generation . . | 30.7±6.4%                 | 19.2±4.6% | 14.8±4.0%             | 12.4±4.1% |

puerperal psychosis, a proportion as high as this have children or grandchildren, or a combination of the two, with mental illness of major or minor degree. If only children and grandchildren treated in hospital are counted the figures are 23 per cent and 35 per cent, respectively.

*Social group distribution* was investigated for the women in the initial material who had adult children and for the parents of the child-generation's controls. In the proband group, the parents belonged to the social groups I and II (high) in 35 per cent and to social group III (low) in 65 per cent. In the corresponding control group the figures were 24 per cent and 76 per cent respectively.

There appeared to be no material differences between probands and controls in respect of the *pattern of causes of death*, but the limited size of the material and the distribution of deaths over such a long time-span make meaningful statistical comparison impossible.

There were 4 suicides in the proband group—two in each of the two generations. Only one of these (from the child generation) was not previously known to a psychiatric hospital. One suicide occurred among the controls of the grandchild generation; this person had previously been under treatment in a psychiatric hospital.

#### DISCUSSION AND CONCLUSIONS

This study shows that a record of mental illness or psychiatric treatment is significantly more common among children of women who have been treated for puerperal psychosis (according to the stated criteria) than among controls selected from the population register. The same tendency is evident in the grandchild generation, but the differences here are not statistically significant.

The figures presented in Table III show that there is a considerable risk of mental illness in the child generation. In the grandchild generation this risk is less. In the control material it is possible to discern a greater tendency to mental morbidity in the younger than in the older generation. This may be explained by the fact that access to psychiatric treatment has become much wider during the lifetime of the younger

generation, and the chance of being registered as having received some form of such treatment is correspondingly increased. The same mechanism has naturally had its effect on the proband side also. The relation there between the child and grandchild generations in respect of the level of mental morbidity cannot of course be interpreted as a mathematical expression of the genetic risk.

It might be argued that growing up with a mother who has been treated for psychosis—even though in most cases of temporary nature—may produce psychological stress and so contribute to the causation of mental illness. On the other hand, the cases of mental illness distribute themselves in a manner which makes a psychogenetic explanation of this kind improbable, or at any rate insufficient. The 28 children affected by mental illness belong to 20 of the 43 women whose children reached adult age. These affected children had 39 unaffected siblings. The 23 women without any affected children had a total of 53 adult children. In both groups of women, half were discharged well and never subsequently came under treatment. One may therefore venture to suggest that the illness of the mothers has had as much or as little influence on the home environment of their children whether they had a mentally ill child or not.

In such an old material as the present one it is difficult to throw much light on the social environment by means of objective and comparable data. The social group distribution of the parents may, however, give a certain, though imprecise, picture of the conditions in which the children grew up. As shown above, in comparison with the corresponding controls the child generation of the proband group shows a preponderance of the better-off social groups I and II at the expense of social group III. The higher level of mental morbidity in the child generation of the proband group cannot therefore be attributed to inferior environmental conditions during childhood, as far as these can be judged by the indicator used here.

This work therefore provides strong evidence of genetically operating factors in the general category of puerperal psychoses. It is not possible to indicate any particular pattern of

major genes, but the fairly high risk of mental illness in the first filial generation suggests that dominant transmission plays some part in the operation of the genetic factors. The patterns of mental illness in the children and the grandchildren are dissimilar, both in nature and degree, and the initial material of women suffering from puerperal psychosis in all probability represents an aetiologically heterogeneous group.

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## Sex Chromosome Aneuploidy among Men in Three Swedish Hospitals for the Mentally Retarded and Maladjusted

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In the mid-1960.s, reports came from Scotland and England of a high frequency of gonosomal aberrations among male patients in maximum security hospitals (Jacobs *et al.*, 1965; Casey *et al.*, 1966). This led to a lively discussion. If these observations could be generalized so as to apply also to similar institutions in other countries, the question would be whether gonosomal aneuploidy had any bearing on the development of criminality and psychic diseases? In particular, the significance of a double Y condition as a predisposing factor was called in question. Unfortunately, from the outset the discussion became too categorical and oversimplified. When in subsequent studies socially well-adjusted individuals of normal intelligence were found, it was doubted whether aneuploidy had any importance at all. In a survey as recent as 1972, for example, Owen questions whether there is any connection at all between excess Y-chromosomes and behaviour disorders and mental diseases. Hook (1973), on the contrary, in a somewhat more detailed compilation, shows that there is a clear connection between the occurrence of double Y-chromosomes and individuals whom he defines as 'mental-penal'. A common feature in all the literature, however, is that almost all writers insist on the importance of more research in this field.

### MATERIAL AND RESULTS

Our study comprises three Swedish hospitals designed for patients with a combination of mental retardation and maladjustment. These three hospitals are special hospitals and are all similar in character. The criteria for admission are, besides mental retardation, maladjustment—for example in the form of aggressiveness difficult to control, grave asociality and the like.

Many, but not all, of the patients are committed for treatment by decision of the courts. Thus all the patients are mentally retarded; the great majority, however, have only a mild degree of mental retardation (i.e. IQ between  $-2$  and  $-3$  SD). When, at the beginning of the 1970's, we made an inventory of the three hospitals, we found a total of 665 admitted patients. We decided to analyse all those with a body length of 180 cm. or more. There were no omissions. Altogether, 117 patients were examined by means of the usual karyotyping of peripheral blood. Our results are shown in Table I. From this table it will be seen that five patients had the karyotype 47,XY; three patients 48,XXYY; one patient 48,XXXY; and three 47,XXY. In addition, chromosomal mosaicism was present in one case (46,XY/47,XXY/48,XXXY).

Thus 2 per cent of the whole population had an abnormal sex complement, if we assume that all those not examined were chromosomally normal. Of the selected group of tall men, those with gonosomal aneuploidy made up 11.1 per cent. Regardless of whether we take the minimum figure of 2 per cent or the potential maximum figure of 11.1 per cent, the frequency of chromosomal aberrations is over-represented in the hospital material. On the basis of other studies we can, in fact, assume that the true frequency of gonosomal aneuploidy in men in the average population, extracted from populations of newly born, does not exceed 0.3 per cent. The difference is statistically significant ( $P < 0.001$ ).

We may further divide the series into patients with excess Y-chromosomes and excess X-chromosomes respectively, and assume that the corresponding true frequency amounts to 0.1

TABLE I  
*Number of men of body length 180 cm. or more with gonosomal aneuploidy revealed on investigation of special hospitals in Sweden for the simultaneously mentally retarded and maladjusted*

| Hospital      | No. of male in-patients on day of investigation | No. of men of body length 180 cm. or more | No. of men of body length 180 cm. or more with gonosomal aneuploidy | Type of deviation |     |      |      |
|---------------|-------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------|-------------------|-----|------|------|
|               |                                                 |                                           |                                                                     | XXY               | XXY | XXYY | XXXY |
| Källshagen .. | 227                                             | 36                                        | 4                                                                   | 1                 | 1*  | 2    |      |
| Salberga ..   | 315                                             | 62                                        | 6                                                                   | 2                 | 2   | 1    | 1    |
| Västra Ny ..  | 123                                             | 19                                        | 3                                                                   | 2                 | 1   |      |      |
| Total ..      | 665                                             | 117                                       | 13                                                                  | 5                 | 4   | 3    | 1    |

\* Mosaic condition 46,XY/47,XXY/48,XXXY.

per cent and 0.2 per cent in the normal population regardless of body length. The figure of 0.1 per cent is based on observations made abroad with pooled, large consecutive series of newly-born children (Hook, 1973). We thus assume that excess mortality does not occur with double Y condition, a fact which is not known, but if this were the case it would merely mean that the true frequency would be even lower. The frequency of men with extra X-chromosomes is known from Hambert's (1965) unselected series of adult Swedish males examined in connection with enrolment for military service. Hambert found a frequency of 0.20 per cent, and this further agrees with that found abroad among newly born in a number of consecutive series.

If we assume in this way that the true frequency of men with excess Y-chromosomes amounts to 0.1 per cent, we then find a statistically significant over-representation ( $P < 0.001$ ) also in a comparison based on the whole population ( $n = 665$ ). Likewise, we have a statistically significant finding ( $P < 0.001$ ) that there are more men with an excess of X-chromosomes in our material, starting from a true frequency among adult males of 0.2 per cent as above.

#### DISCUSSION

After a careful review of the literature, Hook (1973) concludes that the frequency of patients with double Y-chromosomes is over-represented in series from 'mental-penal settings'. He defines 'as mental a setting for individuals who are

retarded, disturbed, psychotic, alcoholic, or epileptic but which is not otherwise characterized; as penal a setting where there is some stated or implicit restriction on freedom because of punitive or security requirements; and as mental-penal a setting which meets both criteria'.

Our finding reinforces Hook's assumption; the frequency of double Y condition observed by us agrees well with what was found by Jacobs *et al.* (1965) and Casey *et al.* (1966).

Many authors have raised the question whether not only an excess of Y-chromosomes but also of X-chromosomes produces a predisposition for 'social deviated behaviour' (see, for example, Nielsen, 1969; Money, 1970; Tsuboi, 1970 and Murken, 1973). If we assume that an excess of Y-chromosomes occurs with a frequency of 1/1,000 men; an excess of X-chromosomes with 1/500 and the combination of both excess X- and Y-chromosomes with about 1/25,000, we then find that all these conditions are over-represented in our series.

Thus our findings do not disprove the hypothesis that both excess X-chromosomes and excess Y-chromosomes produce a predisposition for 'social deviated behaviour' in maladjusted, mentally retarded persons.

#### SUMMARY

In a study comprising three hospitals for mentally retarded and at the same time seriously maladjusted patients, 665 male in-patients were found on a particular day of investigation. Of these patients, all with a body

length of 180 cm. or more, without exception, had a chromosome determination made. Those analysed amounted to 117, and among them were found 13 with gonosomal aneuploidy. The total frequency of gonosomal aneuploidy, like the occurrence of men with excess X-chromosomes or Y-chromosomes only, showed a statistically significant increase.

#### CASE HISTORIES

##### *No. 1. Born 1947. 47,XTY*

Rather unfavourable upbringing. Criminal offences from the age of 8 years (thefts, breaking-in, damage to property, assault, later also sexual assault). Early exceedingly aggressive. From age of 10, under continuous treatment in institutions for the mentally retarded, from 16 in special hospitals. Test values around IQ 70 according to Terman-Merrill.

##### *No. 2. Born 1941. 47,XTY*

Both parents died when he was 3 years old, after which he was with foster-parents and from the age of 13 years under continuous treatment in institutions for the mentally retarded. From 26 to 30 years, in a special hospital on account of homosexual activities and exhibitionism. Seriously retarded, with test values varying from IQ 34 to 43 according to Terman-Merrill.

##### *No. 3. Born 1916. 47,XTY*

Stable home environment. From age of 7 under continuous treatment in institutions for the mentally retarded, including 30 years in special hospitals because of escapes and moderate aggressiveness, including for example threatening behaviour in a love affair. Serious retardation, with IQ values around 40 according to Terman-Merrill.

##### *No. 4. Born 1951. 47,XTY*

Somewhat unfavourable upbringing. Criminal offences from the age of 12 (thefts, damage to property, assault). At 19 years, admitted to boarding school for the mentally retarded; between the ages of 16 and 19 in special hospital. Test values between IQ 70 and 78 according to Terman-Merrill.

##### *No. 5. Born 1947. 47,XTY*

Stable home environment. Early abuse of alcohol. Criminal offences from the age of 17 (driving while under the influence of drink, thefts, assault, damage to property, drunkenness). When sober, very aggressive. Sent to prison at age of 21; from age of 22 committed to special hospital by a court decision. IQ 71 according to Terman-Merrill.

##### *No. 6. Born 1941. 48,XXYY*

Stable home environment. Special school from 8 to 13 years. From age of 14, continuous institutional care; from 19 in special hospital. Criminal offences from age of 17 (thefts, breaking-in, damage to property, assault, indecent assault on little girls). At times very aggressive. IQ 47 according to Terman-Merrill.

##### *No. 7. Born 1916. 48,XXYY*

Stable home environment. After considerable difficulty at school, admitted to special boarding school at age of 11, and thereafter under continuous institutional care. From age of 31, under treatment in special hospital. Long-term aggressive behaviour and sexually threatening in speech and gesture. IQ 47 according to Terman-Merrill.

##### *No. 8. Born 1943. 48,XXYY*

Stable home environment. Admitted at age of 12 to special boarding school, after which under continuous institutional care. From age 16 in special hospital. At age of 15 set fire to his boarding school. From the same year, many kinds of criminal offence (thefts, breaking-in, sexual assault under threat of stabbing). Moderate aggressiveness through the years. Test values according to Terman-Merrill have varied between IQ 51 and IQ 54.

##### *No. 9. Born 1943. 48,XXYY*

Unfavourable upbringing. Illegitimate. Apart from a year with foster-parents, he has lived in institutions from the age of 2 years, and from the age of 4 has spent the whole time under organizations for the care of the mentally retarded. From the age of 16, mostly under care in a special hospital. Long-term serious aggressiveness, with blows and damage. A certain amount of homosexual activity. IQ 43 according to Terman-Merrill.

##### *No. 10. Born 1923. 46,XY/47,XY/48,XXYY*

Stable home environment. At age of 7, admitted to institution for mentally retarded patients, and afterwards under continuous institutional care, from 1955 in a special hospital. Admission indications severe emotional outbursts and destructiveness. Gravely retarded, with IQ 35 according to Terman-Merrill.

##### *No. 11. Born 1941. 47,XTY*

Brought up in normal environment. Tuition in remedial class. Criminal offences from the age of 14 (thefts, breaking-in, fraud, drunkenness, sexual offence with 4-year-old girl, etc.). Admitted to detention home at age of 15, to an ordinary mental hospital at 17, and to a special hospital the same year. Considerable abuse of alcohol. With certain intervals of trial discharge, still in special hospital in March 1973 (age 32). IQ varies from 51 and 60 according to Terman-Merrill. Also has a long-term psychotic reaction with auditory hallucinosis.

##### *No. 12. Born 1921. 47,XTY*

Brought up in fairly favourable environment. Great difficulty at unspecialized country school. Low working capacity all his life. Admitted to ordinary mental hospital at age of 43. Convicted of theft at age of 40. Sexual offences with small boys became known when he was 45. Committed for treatment in special hospital by court order, 1967. IQ 49 according to Terman-Merrill.

##### *No. 13. Born 1919. 47,XTY*

Relatively favourable upbringing. Criminal offences from the age of 16 (pilfering, thefts, breaking-in, forgery). From same age, increasing abuse of alcohol. During 1955-1972



admitted to special hospital there times, for a total of 15 years. Also admitted for short periods to an ordinary mental hospital. Schooling in remedial class. IQ 68, 70 and 71 according to Terman-Merrill, on different occasions.

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## XYY Individuals in a Special School

By D. F. CLARK and A. W. JOHNSTON

The steady stream of publications on the XYY syndrome, including recent papers by Christensen and Nielsen (1973) and a comprehensive review by Hook (1973), demonstrates clearly that confirmation or refutation of the relationship in this syndrome between dull intelligence, even mental deficiency, and impulsive or delinquent behaviour requires further evidence. In an attempt to supply such evidence this report presents psychological and anthropometric information about five XYY subjects detected from amongst attenders at the Special School in the city of Aberdeen.

Hook (1973) remarks that there is a wide spectrum of IQs already noted in XYY subjects reported, but in at least three other selected settings that were not specifically for retarded individuals the IQs of XYYs in custody were lower than those of institutionalized controls (Hook and Kim, 1970; Griffiths *et al.*, 1970; Melnyk *et al.*, 1969). Griffiths *et al.*, for example, found the average IQ of twelve XYY prisoners to be 95 compared to a mean of 108 in twelve controls matched by age and height, a statistically significant trend which was noted on both performance and verbal scales. In their 1973 paper Christensen and Nielsen also remark that the IQ findings, using the WAIS full scale IQ gave a mean of 98 with a range of 91 to 121 in ten XYY males from a psychiatric hospital, a forensic psychiatric clinic and an institution for criminal psychopaths. Incidentally, these authors point out that control groups were unnecessary, since test data could be matched against the established norms for the WAIS test. Casey *et al.* (1973) argue that the effect of an XYY complement is mainly on IQ and only indirectly on behaviour, while Price and Whatmore (1967) concluded that a severe personality disorder affecting intellect and behaviour was the striking feature. Hook (1973), summarizing the data with regard

to intelligence when taken in conjunction with the prevalence rates, suggests that either (i) the behavioural manifestations of the phenotype in XYYs in custody tend to interfere with acquisition of a (measurably) normal intelligence, or that (ii) the same events that result in deviant behaviour also influence intelligence.

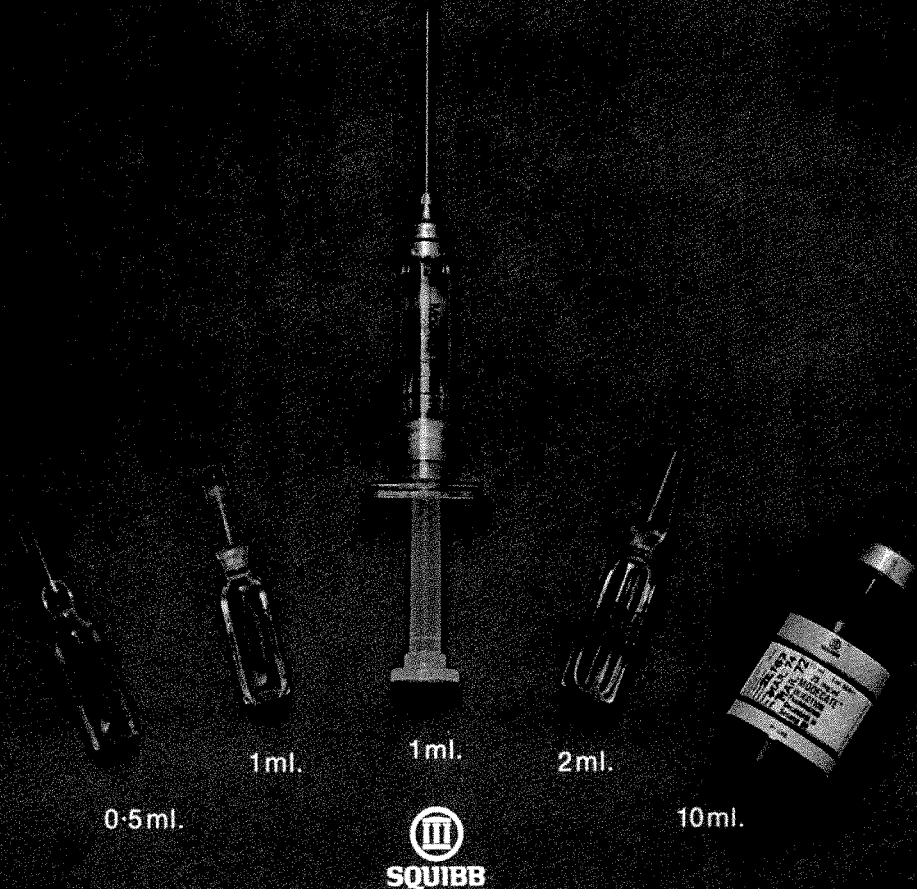
Other psychological aspects looked at by various authors indicate lower sociability and less extraversion (Griffiths *et al.*, 1970) and differences in psychological defensiveness between institutionalized XYY and XY individuals (Hope *et al.*, 1967). Again it is possible that these differences may indirectly relate to intelligence differences, since other reports find no noticeable psychological differences between deviant XY and XYY persons where there is no marked discrepancy in IQ levels (Melnyk *et al.*, 1969; McKerracher, 1971). Hook (1973) concludes that increased impulsiveness rather than greater aggressiveness appears more likely to be the relevant factor underlying much behaviour disturbance in XYYs, but that no objective psychological data are yet available on this point. Noel (1973) also suggests impulsivity together with inadequate emotional control as significant features of these individuals; moreover, his sample was of military conscripts and men undergoing routine medical checks.

With regard to the frequency of XYY cases in the population generally, pooled frequency in various studies of newborn boys quoted by Hook (1973) is about 0.1 per cent, whereas rates quoted by individual studies range up to about 0.4 per cent. The discrepancy between the number of XYY individuals detected at birth and in later life has attracted considerable attention. Court Brown (1968) estimated that there could be as many as 1,800 males with 47 XYY, aged 15 years or more in Scotland, but less than 2 per cent of that number had been identified. He used the frequency of 1 in 1,000 at

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birth, which tallies with that quoted by Hook (1973), but the figure according to Ratcliffe (1972) may be even higher, possibly about 1 in 580 newborn males. So far as prevalence is concerned, Hook suggests a point estimate of 2 per cent for most 'mental-penal' settings, and he remarks that this figure is five times the maximum background rate of 0.4 per cent used for comparison and about twenty times the pooled newborn rate of 0.1 per cent. It would appear, therefore, that there can be little question that the prevalence rate of XYY individuals is markedly increased in 'mental-penal' settings above the general population base rates. Hook's (1973) paper discusses possible explanatory hypotheses.

#### THE SUBJECTS

In the North Eastern Region of Scotland a psychiatric case register has been in existence for a number of years (Baldwin *et al.*, 1965). This register was used as the basis of a prevalence study of mentally subnormal individuals (Innes *et al.*, 1968) who were ascertained mainly from hospital records and local authority sources, including Education Departments. Since 1966 a cytogenetic survey of those on the subnormality register has been in progress, and this has now been completed. A peripheral blood culture technique was used throughout.

As a result, five XYY individuals have been detected among those who attended the Special School in Aberdeen which serves a population of approximately 200,000 living in and around the city. All had been originally tested at different ages by the Education Authority, using the Terman-Merrill Scale (Form LM). The range in IQ on original testing was from

52 to 70 and the subjects are now aged between 12 and 21. They were seen either as out-patients or, in the case of two who were reluctant to attend hospital, in their own homes. The tests therefore needed to be administered briefly and in a variety of settings, while retaining the patients' co-operation. They were also appropriate to dull intelligence levels. The tests selected aimed to provide a wide scanning of cognitive level, planning capacity, impulsivity and motor control. The following were used: The Peabody Picture Vocabulary Test, the Coloured Progressive Matrices, the Goodenough-Harris Draw-a-Person Test, the Porteus Mazes with Q score, the Gibson Spiral Maze, the Holborn Reading Scale and the Eysenck-Withers Personality Inventory. Data from the Vineland Social Maturity Scale were available from other sources.

#### RESULTS

Anthropometric and psychological data are set out in Tables I and II respectively.

As expected, it can be clearly seen that all of these subjects are either borderline feeble-minded or dull and backward, although there is a relatively wide scatter of IQs. Mean IQs obtained for each test did not differ significantly on t-test, although the difference between original ESN school testing and current IQ approaches significance ( $t = 1.96$ ;  $p \approx 0.10$ ). McKerracher's (1971) finding that performance dominance tended to occur in such subjects was checked by taking the Progressive Matrices and Goodenough-Harris Tests as performance scales against the PPVT as a verbal scale. The mean IQ of the two former tests when contrasted with the IQ on the latter showed that only subject number 5 had a lower performance than verbal

TABLE I  
*Anthropometric data on 5 XYY subjects*

| Case | Age | Height (cm.) | L.S. (cm.) | Span (cm.) | Maternal age | Paternal age | Sibship position |
|------|-----|--------------|------------|------------|--------------|--------------|------------------|
| 1    | 21  | 183          | 96         | 191        | 27           | 37           | 4/5              |
| 2    | 16½ | 175          | 88         | 170        | 26           | 34           | 3/3              |
| 3    | 21½ | 191          | —          | 199        | 41           | 38           | 2/2              |
| 4    | 12½ | 152          | 79         | 150        | 21           | 27           | 1/1              |
| 5    | 21½ | 183          | 96         | 188        | 19           | 19           | 1/5              |

TABLE II  
Psychometric data on 5 XYX subjects

| Case       | Date of birth | Previous IQ Terman-Merrill (LM) | Intelligence |      |      | Porteus maze test quotient | 'Q' score | Gibson spiral maze |        | Holborn reading age (years) | Vine-Land social quotient | Eysenck-Withers personality inventory |      |     |
|------------|---------------|---------------------------------|--------------|------|------|----------------------------|-----------|--------------------|--------|-----------------------------|---------------------------|---------------------------------------|------|-----|
|            |               |                                 | PPVT         | CPM  | GH   |                            |           | Time               | Errors |                             |                           | N                                     | E    | L   |
| 1          | 21.9.50       | 70                              | 83           | 79   | 96   | 76                         | 57        | 50                 | 24     | 10                          | 69                        | 11                                    | 14   | 5   |
| 2          | 30.4.55       | 55                              | 63           | 65   | 56   | 48                         | 65        | 96                 | 19     | 6½                          | 67                        | 13                                    | 16   | 5   |
| 3          | 28.3.50       | 52                              | 58           | 53   | 73   | 36                         | 78        | 41                 | 22     | 5                           | 55                        | 5                                     | 15   | 4   |
| 4          | 25.9.59       | 65                              | 70           | 77   | 78   | 83                         | 32        | 65                 | 11     | 8                           | 78                        | 9                                     | 12   | 4   |
| 5          | 18.3.50       | 55                              | 88           | 70   | 54   | 91                         | 41        | 18                 | 36     | 8½                          | 56                        | 4                                     | 11   | 4   |
| <i>Age</i> |               |                                 |              |      |      |                            |           |                    |        |                             |                           |                                       |      |     |
| $\bar{X}$  | 18.2          | 59.4                            | 72.4         | 68.8 | 71.4 | 66.8                       | 54.6      | 54.0               | 22.4   |                             | 65                        | 8.4                                   | 13.6 | 4.4 |
| S.D.       | 3.66          | 6.8                             | 11.4         | 9.4  | 15.4 | 21.2                       | 16.4      | 26.0               | 8.1    |                             | 8.6                       | 3.4                                   | 1.9  | 0.5 |

PPVT = Peabody Picture Vocabulary Test.

CPM = Coloured Progressive Matrices

GH = Goodenough-Harris Draw-a-Person Test

scale and to this extent the findings are consistent with McKerracher's.

The relationship of Porteus Maze Test quotients to IQ is somewhat uncertain, since the former is considered to measure, in a large part, planning capacity; but the Q score was included since this possesses relatively good predictive validity as a measure of impulsivity or delinquency when it is greater than approximately 50 (Porteus, 1959; Tobias and Gorelick, 1962). It should be noted that in three of the five cases reported here the 'Q' score was significantly high. In the same way, the Gibson Spiral Maze, although standardized on younger subjects, has been taken to indicate impulsivity and poverty of motor control (Gibson, 1964), and it can be seen that the latter was demonstrated in every case, although there was some variation in the tempo of performance. More requires to be known about the interpretation of this test, but raw scores are reported so that later work may incorporate these. If the two tests are taken together and either is positive then all subjects except case number 4 qualify as being significantly impulsive, thus lending support to Hook's (1973) proposition. Yet again, however, the effects of dull intelligence must be allowed for on both of these tests, since it is likely

that this would be associated with relatively poor motor control which in turn would adversely affect scores.

Analysis of the Holborn Reading Age of all subjects shows them to be backward, markedly so in four cases. The general lack of social maturation and competence is adequately reflected in the mean social quotient of 65, which is again consistent with the general poor cognitive level of these subjects.

Previous writers have administered the Eysenck Personality Inventory to XYX subjects in an attempt to establish personality parameters, but this was not considered appropriate because of the dullness of the subjects, and consequently the Eysenck-Withers Personality Inventory, which was specifically designed for such subjects, was used (Eysenck, 1965; Clark, 1974). The interpretation of factor scores, however, is equivalent to the interpretation of these on the EPI. In fact these subjects did not differ significantly from normative groups of matched intelligence on either introversion or neuroticism. Defensiveness as measured by the lie score was somewhat lower than usual, though not significantly so.

There were no significant projective elements in the Drawing Test, although the latter was

used primarily as a measure of intelligence following demonstration by factor-analytic studies (Nichols and Strümpfer, 1962; Adler, 1970) which showed that the test loads heavily on a primary factor of cognitive development related to intelligence.

Scrutiny of both psychometric and qualitative data gained from interview and patient history makes plain the difficulties experienced by many investigators of the XYY syndrome in formulating satisfactory hypotheses about the aetiology of the disturbed, impulsive or erratic behaviour which some subjects demonstrate. The social and environmental background of many subjects may well have contributed to the former as much as the XYY chromosome complement itself. Indeed, the improvement of environment represented by attendance at a Special School clearly reflects itself in the slight relative gain in measured intelligence between the current testing and the original Terman-Merrill scores achieved on entry. However, all subjects showed signs of some maladjustment. Detailed investigation of early records pertaining to the boys' admission to the school shows that subject 1 was referred by his headmaster because of poor educational progress with dyslalia. He was noted to be a persistent liar and easily led, and a history of theft was later elicited. He is now a fishworker. Subject 2 similarly had poor speech and motor co-ordination. He was prone to wander from home and to thief. At present he attends a senior occupation centre. Subject 3, whose mother was elderly, was found early in his life to be solitary, timid and very easily led. His behaviour, including that at interview, was withdrawn and stubborn, but he was later found to be much more extraverted behaviourally than his test score would have predicted. He works as an egg-packer. In the family of subject 4 there is a history of psychiatric disturbance. He himself has been hyperkinetic, has a tic, and has been so disobedient as to require the care of a child psychiatrist. He is considered chronically unstable by his teachers at the Special School he still attends. Subject 5 was originally referred simply because he had made little educational progress, being withdrawn and disinterested in school work. While it is true that he was temporarily out of work, he

generally appeared to be the most stable of the five, and on the whole the test scores supported this clinical impression.

Some additional information, including height and sibship position, is given on Table I. The mean maternal age is 26.8 years and the mean paternal age is 31.0. These figures are in agreement with the larger series of Court Brown (1968) where there was no evidence of a paternal age effect.

#### DISCUSSION

As the review of Hook (1973) would suggest, the balance of evidence is in favour of a positively skewed curve of intelligence in the XYY syndrome. Similarly Penrose (1971) estimated that the mean IQ of an XYY as an individual would be 92 and that 9 per cent would be mentally defective. It should be noted that when relatively high level of intelligence has been reported it is because it has been in the past regarded as likely to be exceptional (Borgaonkar *et al.*, 1968; Forssman *et al.*, 1968; Leff and Scott, 1968; Wiener and Sutherland, 1968). Court Brown (1968) collected all the cases of the syndrome identified sporadically rather than from surveys on a basis of height or behavioural characteristics. Some of these had other syndromes associated with mental retardation, such as mongolism, and for some insufficient information is available. It appears that five were subnormal and at least two more were of low normal intelligence. Moor (1967), without stating the criteria for selection, concluded from 27 reported cases that 41 per cent were subnormal and a further 18 per cent low normal. In contrast, Nielsen and Tsuboi (1969) reported a mean IQ of 99 in nine cases who were found in psychiatric institutions where selection was not based on intelligence but where other factors may have resulted in bias. They noted that of the previously reported 29 patients with the XYY syndrome who had intelligence testing carried out there was a mean IQ of 85 and 17 of these 29 patients had an IQ below 90 compared with none of their patients. Berg and Smith (1971) concluded that although some degree of intellectual deficit is evident in most recorded instances it is usually mild. A personal review of 16 of the earliest unselected cases to be

reported, and for whom enough information is provided, shows that 5 were subnormal and only 7 of average intelligence, the remaining quarter being low normal. These conflicting results emphasize the almost inevitable selection so that a final conclusion as to the level of intelligence cannot yet be drawn. However, the prevalence reported here of five cases in one Special School, when matched against the proportion of the population at large attending such a school, leads us to believe that further cases of the XYY syndrome in the dull category of intelligence will be discovered.

Another approach to the frequency of retardation is to relate the number of XYY individuals found in our survey to the general population of the area. This raises questions concerning the completeness of ascertainment and once again the extent to which selection has occurred. It is probable that many slightly retarded persons born before 1948 will not have been detected, but because of the requirements of the Education (Scotland) Act (1946) ascertainment should be much more complete for those born subsequently, with the exception of pre-school children. It was therefore decided to use the number of those in the survey born between 2 March 1948 and 1 March 1963 as a basis for comparison. Because of the earlier provision of special school facilities for the city of Aberdeen it is interesting, and perhaps more appropriate, to compare the number of XYY subjects, with those on the retardation register from the same area. In the whole region there were 783 males born during this period, and of these there were 332 from the city of Aberdeen. This gives figures of 5 in 783 (1 in 156) and 4 in 332 (1 in 83) respectively, suggesting that there is indeed an increased liability to retardation, perhaps as much as seven-fold, using 1 in 580 as the incidence in the newborn. Penrose (1971) suggested a threefold increase, using a newborn incidence of 1 per 1,000. An alternative way of looking at these figures is to compare them with the total male population of the city of Aberdeen. At the last census in 1971 there were 22,820 born between 1946 and 1960, the nearest comparable period. One would therefore expect about 40 XYY persons in the general population in this age range and less than one in the retarded

population of 332. That four were found again suggests that mental subnormality occurs in some persons with an XYY constitution. By comparison, in the same population, there were two individuals with Klinefelter's syndrome. This approach again suggests that further XYY boys will be found in special schools, and perhaps in other groups containing individuals with minor degrees of retardation.

However, it is pertinent to ask how much selection has occurred and what factors are involved, such as intelligence or behavioural problems. Other significant variables may include height. In this connection it should be noted that of the three adults two are 6 ft 1 in. and the third 6 ft. 3 in. (Table I). Height, of course, was not the reason for their inclusion in this series. It could, however, be argued that a backward, awkward and tall boy would be more likely to be referred to a special school. Hook (1973) also discussed this possibility in terms of his 'social hypothesis'. He also referred to a study of about 11,000 males ascertained at birth in a perinatal study by the National Institute of Neurological Diseases. Psychological data have already been obtained which it may prove rewarding to study in retrospect for any XYY individuals identified. This could provide the best unbiased sample so far.

Similar arguments, including behavioural and criminal tendencies, apply to the inclusion of Klinefelter's syndrome in our survey, and they are likely to affect other series also. For example, Tsuboi (1970) found five 47, XXY and five 47, XYY patients among 480 men in two institutions for criminal psychopaths. Clark *et al.* (1970), elaborated by Rosen *et al.* (1971), concluded that between the two syndromes there was little difference in behaviour or criminal records. However, psychometric and socio-cultural characteristics of the five subjects reported here would suggest that the 'impulsiveness' hypothesis of Hook (1973) may fit better than the 'delinquency' or psychopathy hypothesis. Nevertheless, in any special school population such impulsiveness, whether or not reflected in test scores, would be likely to be more frequent because of cultural deprivation, minimal brain damage, social and interpersonal pressures and educational inadequacy.



## CONCLUSIONS AND SUMMARY

Data on five XYY subjects from a special school setting are reported as adding to the sum of information available. With increasing evidence, it is becoming more likely that further XYY subjects will be found in normal as well as institutional or 'mental-penal' situations, and that there is an even greater likelihood of finding such individuals among dull intelligence, borderline and retarded populations. This does not exclude the possibility of XYY subjects of average or above average intelligence, but would confirm the presence of a positively skewed distribution of intelligence in XYY persons.

Quantitatively, it is clear that the five subjects reported here are of borderline or feeble-minded intellectual level, with a mean IQ around two standard deviations below the general population mean. There is some evidence of a tendency toward performance rather than verbal dominance in cognitive skills, but at the same time evidence of motor carelessness and impulsivity. Social maturity is also subnormal.

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## Season of Birth in the General Population and in Patients with Mental Disorder in Norway

By ØRNULV ØDEGÅRD

It has been shown by Knobloch and Pasamann that a disproportionate number of oligophrenics are born during the first months of the year. This appears to be true mainly in warmer climates and is supposed to be related to nutritional problems which arise when the most sensitive weeks of pregnancy coincide with the unpleasantly warm summer months. Such findings have led to a revival of the interest in the monthly birth distribution of schizophrenics. There is some evidence that this pattern actually differs from that of the general population, and para-natal complications could be the explanation.

The monthly birth distribution of psychotic patients has to be studied in relation to the corresponding pattern in the general population. The official statistics of Norway make this possible, since the month of birth has been registered continuously for more than a hundred years. For psychotics detailed data are available in the National Register of psychiatric in-patients.

### *The monthly birth distribution in the general population*

The factor of sex can be excluded as insignificant in this connection. Comparisons between

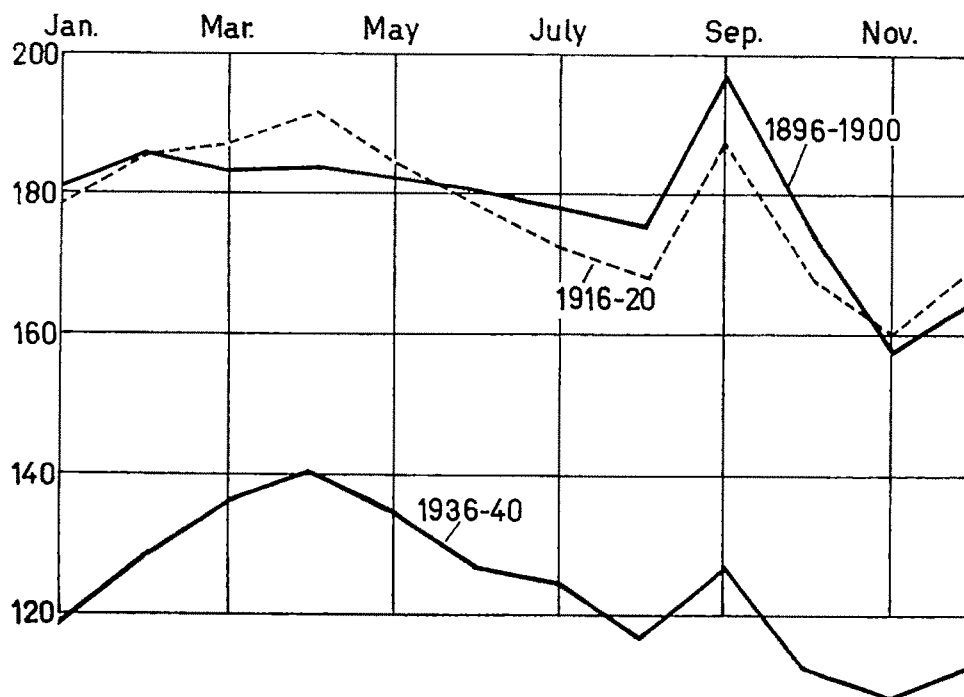


FIG. 1.—The daily number of births in Norway from month to month for selected five-year periods. (Absolute figures.)

male and female births show that there is no difference in the monthly pattern. In the following all tabulations are therefore given for both sexes together.

#### *The monthly pattern*

Fig. 1 shows that the number of births per day varies according to an approximately sinusoidal curve, with a maximum in January-May and a minimum in October-December. A second maximum, which is more sharply defined, is observed in September. The cyclic curve follows the seasons of the year in a truly 'biological' fashion. The September peak, on the other hand, suggests an origin in causes more sharply defined in time, and the most likely explanation is that of a maximum of conceptions in connection with the traditional mid-winter festivities around Christmas and the New Year. Clearly the two maxima differ so radically in character and in origin that they should be studied separately (which has not always been done).

A somewhat simplified presentation is indi-

cated, particularly for the study of long time trends, and for this purpose the *amplitude* is used namely the number of births per day during the January-May maximum in per cent of the number during the October-December minimum. Similarly, the September maximum is expressed by comparison with the adjoining months of August and October.

#### *The time trend, 1866-1970*

The long-time trend is presented because it illustrates the dependence of the birth pattern on socio-economic fluctuations. Fig. 2 shows that during the entire period of investigation the September maximum has remained at a level of 108 to 113 per cent of the adjoining months, strongly suggesting an origin in some phenomenon, which has not undergone any change during this long period. The mid-winter traditions fit in very well with this.

The January-May maximum, on the other hand, varies markedly from 107.5 per cent of the minimum in 1906-10 to 125.5 per cent in 1946-50, and the variations are clearly associa-

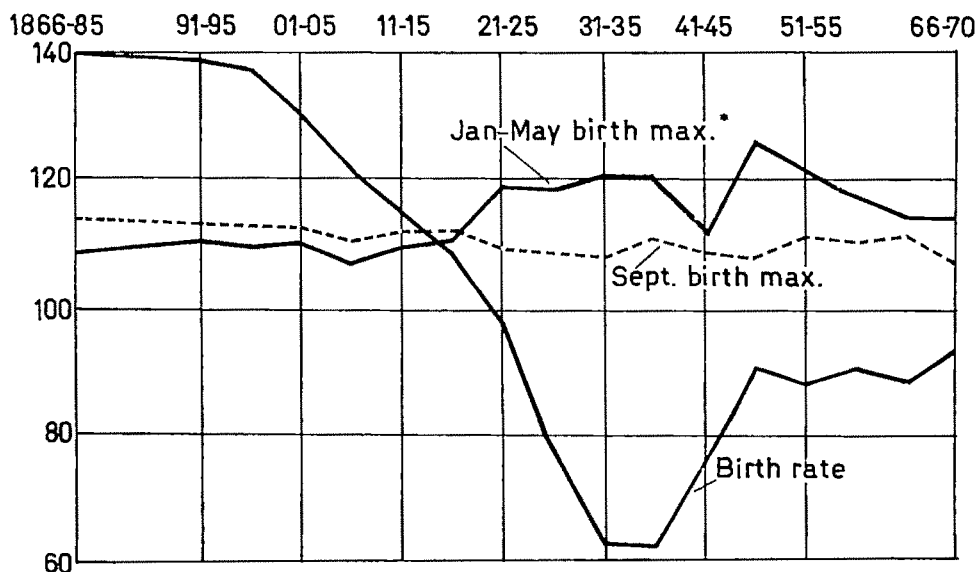


FIG. 2.—The monthly distribution of births in Norway, 1866-1970, in relation to the birth rate.

*September birth maximum:* The number of births per day in September in per cent of the number in August + October.

*January-May birth maximum:* The number of births per day in the months of January-May in per cent of the number in October-December.

\* For the five-year periods from 1936 to 1970 the birth maximum lies in February-May.

*Birth rate:* The number of births in Norway per year per 1,000 women 15 to 44 years of age.

ted with socio-economic conditions and with the birth rate. Our period of investigation goes back far enough to include the last years of relatively natural and uncontrolled fertility, when there was a birth rate of around 140 per year per 1,000 women 15 to 44 years of age. From 1900 on there is a nearly linear decrease, which has no other reasonable explanation than the gradual introduction of birth control-conscious family planning. This did not, however, influence the monthly birth pattern, and both maxima remained at a level of 110 per cent.

In the 1920's and 30's the decrease of the birth rate becomes steeper, and in 1936-40 an all-time minimum of 62.1 is reached. This coincides with a period of economic crisis and unemployment. The monthly birth pattern behaves quite differently during this critical period: the cyclic maximum *increases* from 111.3 to 119 per cent of the minimum, and remains at this level for 20 years. Evidently the birth restrictions caused by adverse economic conditions are not evenly distributed over the months of the year, but make themselves felt particularly when deeper socio-biological factors are also unfavourable and the birth rate is at a minimum.

From 1936-40 to 1941-45 the birth rate in Norway increased from 62.1 to 75.2, the first increase for more than 40 years. Possibly the adverse conditions during the war and the German occupation of Norway led to a stimulation of family coherence. The significant decrease in the rate of first admissions to psychiatric hospitals points in this direction. Interestingly, the cyclic birth maximum *decreased* during the same interval—from 120 to 112, which suggests that the increasing birth rate during the war somehow took place regardless of unfavourable socio-biological conditions.

During the first five-year period after World War II the birth rate continued to increase, in part because of a great number of 'postponed' marriages and pregnancies. At the same time the cyclic birth maximum also increased, from 111.9 to 125.5, the most dramatic change registered during our period of investigation, and the only instance of birth rate and monthly birth pattern following each other.

Since 1945 Norway has enjoyed political and economic stability, with a rising standard of

living and of social welfare. During this period the birth rate has failed to increase, probably because birth control has now spread to the entire population, including the lower classes in the rural areas. This has offset the slightly increasing fertility in the urban middle class. During this stable and on the whole favourable period the cyclic birth maximum has shown a slightly decreasing trend.

We conclude that the January-May birth maximum tends to remain constant under normal circumstances, but reacts sensitively to critical situations. The changes are negatively correlated with the changes in the birth rate ( $r = -0.708$ ). There is no evidence of the cyclic birth maximum disappearing after the manner of an old biological inheritance which has become extinct, but our period of investigation may, of course, be too short for such evolutionary trends to show up.

The September birth maximum (the mid-winter maximum of conceptions) shows a remarkable stability during the entire period. What slight variation there is correlates *positively* with the changes in birth rate ( $r = 0.585$ ).

It is evident that when comparing groups of patients with the general population one must keep the time factor under control by always comparing groups with approximately the same years of birth.

#### *The urban-rural differential*

During the first ten years of our period of investigation from 1891 to 1900, the cyclic January-May birth maximum was around 117 per cent in the rural districts, while in the cities there was no significant difference between January-May and October-December. Gradually the monthly birth pattern became increasingly clear even in the cities, and since 1936 there has been practically no urban-rural difference. The same is true of the September maximum.

For a statistical comparison between the general population and psychotic patient groups the urban-rural variable can be regarded as insignificant. The only possible exception is represented, by diagnostic groups that have a markedly higher incidence in cities than in rural areas. This applies to the psychoses of the

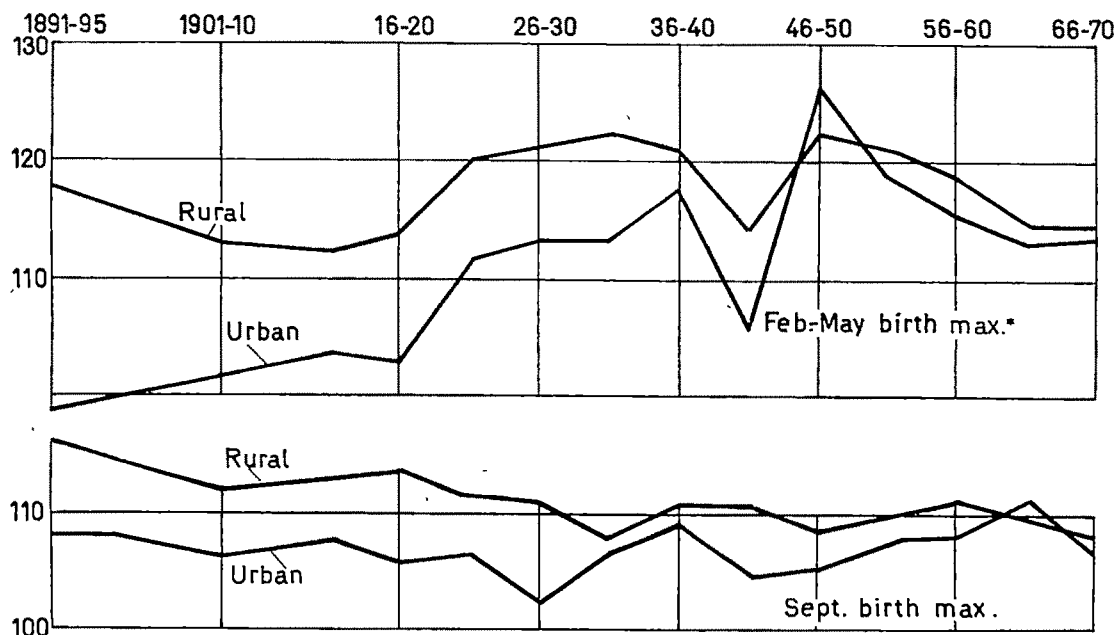


Fig. 3.—Long-term trend of the two birth maxima in cities and rural districts.

\* From 1891 to 1935 the maximum is January-May.

senium and to alcoholic psychoses, in particular as regards groups with year of birth previous to 1900. Schizophrenia and manic-depressive psychoses have (in Norway) been shown to have the same incidence in rural as in urban areas.

#### *The monthly birth distribution in mental disorders*

From the National Case Register we have selected patients born between 1870 and 1939 with known dates of birth. Among the great number of variables available only the most relevant ones have been studied on this occasion, namely psychiatric diagnosis, occupation, and year of birth. As seen from Table I the total number of cases is 62,190, which would seem to be a sufficiently large number, but which in fact does not allow for anything but rather coarse subdivisions. With five diagnostic groups, three periods of time and five occupations, in addition to the twelve months of the year, we arrive at a total of 900 subgroups, which is about as much as the material will permit.

It has been shown that the monthly distribution of births varies with time, and for each patient group an appropriate control has been selected from the official birth statistics. As

shown in Table I one has to take into consideration the different age distribution of the five diagnostic categories, for instance by using older controls for manic-depressive patients than for schizophrenics.

A direct comparison between numbers of patients and of controls in each month has been carried out by means of Smith's modification of Edwards' chi squared test for cyclic trends (as employed by Hare). The lower part of Table I shows that schizophrenics differ significantly from the other diagnostic groups as well as from the general population. In all diagnostic groups there is a tendency for the difference between patients and general population to increase with time. For non-psychotic patients the difference becomes significant on the 5 per cent level for the 1920-39 period.

Fig. 4 shows the twelve-monthly birth curve for the five diagnostic categories, each compared with the corresponding general population. The schizophrenic birth maximum is seen to be most marked in January-March, while the September maximum is lower than in either the general population or the other patient groups.

TABLE I

|                                                                   | Year of birth | Schiz.   | Man.-depr. | Reactive psychos. | Other psychos. | Not psychotic | Total  |
|-------------------------------------------------------------------|---------------|----------|------------|-------------------|----------------|---------------|--------|
| Number of patients ..                                             | 1870-99       | 6,823    | 3,882      | 4,283             | 8,813          | 731           | 24,532 |
|                                                                   | 1900-19       | 8,781    | 2,375      | 7,576             | 4,277          | 2,080         | 25,089 |
|                                                                   | 1920-39       | 4,136    | 505        | 4,238             | 1,827          | 1,863         | 12,569 |
| Controls (births in general population) ..                        | 1870-99       | 1891-95  | 1891-95    | 1891-95           | 1891-95        | 1891-95       |        |
|                                                                   | 1900-19       | 1906-15  | 1901-10    | 1906-15           | 1901-10        | 1911-20       |        |
|                                                                   | 1920-39       | 1926-35  | 1921-30    | 1926-35           | 1921-30        | 1931-40       |        |
| Chi squared for the difference: patients v. general population .. | 1870-99       | 7.96*    | 0.12       | 1.22              | 1.26           | 1.52          |        |
|                                                                   | 1900-19       | 17.30*** | 3.32       | 0.42              | 2.16           | 5.80          |        |
|                                                                   | 1920-39       | 25.43*** | 3.49       | 1.38              | 2.78           | 8.53*         |        |

\* = 0.05 > p > 0.01    \*\* = 0.01 > p > 0.001    \*\*\* = 0.001 > p    2 d.f.

The group of non-psychotic patients is small, and the curve correspondingly irregular (non-psychotic cases are not consistently included in the registration system). The curve is significantly different from the rest, with a very marked September peak and an additional peak in May. This May maximum is exceptional, and could simply be an irregularity due to the small number of cases. It should be noted, however, that a fairly distinct May peak is observed even in the group of manic-depressive psychoses.

Table II shows that the only significant difference between the patients and the general population is the marked cyclic variation in schizophrenia, between a maximum of 120.2 and a minimum of 100. The Table also demonstrates the importance of using an appropriate control material, adjusted to the average year of birth of each diagnostic category.

#### *Month of birth and occupation*

Data on occupation and month of birth were available for 58,884 first admissions born between 1870 and 1939. In 3,250 cases no known occupation was given. Statistical information on occupation and date of birth is not available for the general population. Tables could be worked out from unpublished census material, but in the present paper only data on mental patients are given (Table III).

The highest seasonal birth maxima are observed for farmers and fishermen, and this is true of the cyclic ('biological') as well as the September (mid-winter conception) maximum. The fact that these are rural occupations is

TABLE II

*The January-May maximum of births is given in per cent of the October-December minimum, and the September maximum in per cent of the births for August plus October. The figures are based upon daily numbers of births, thereby correcting for the different length of the months.*

*Each diagnostic group is compared with the general population which fits best in year of birth: Non-psychotic patients are on the average younger, while the group of 'other psychoses' is the oldest one*

|                                           | Jan.-May maximum | September maximum |
|-------------------------------------------|------------------|-------------------|
| Schizophrenia ..                          | 120.2            | 109.9             |
| Reactive psychoses ..                     | 114.8            | 114.6             |
| General population 1901-15 ..             | 109.3            | 110.4             |
| Manic-depressive psychosis ..             | 114.6            | 114.6             |
| Other psychoses (organic, symptomatic) .. | 110.8            | 108.8             |
| General population 1891-1900 ..           | 112.8            | 112.8             |
| Non-psychotic ..                          | 125.8            | 115.1             |
| General population 1921-25 ..             | 118.6            | 121.6             |

probably of significance. The figures show no clear pattern for social status. When the two occupations connected with trade are compared, we find that owners and managers have clearly higher birth maxima than employees. This pattern is reversed, however, for the two groups of public service and professional service: The monthly variations are lower in the group with the higher social status.

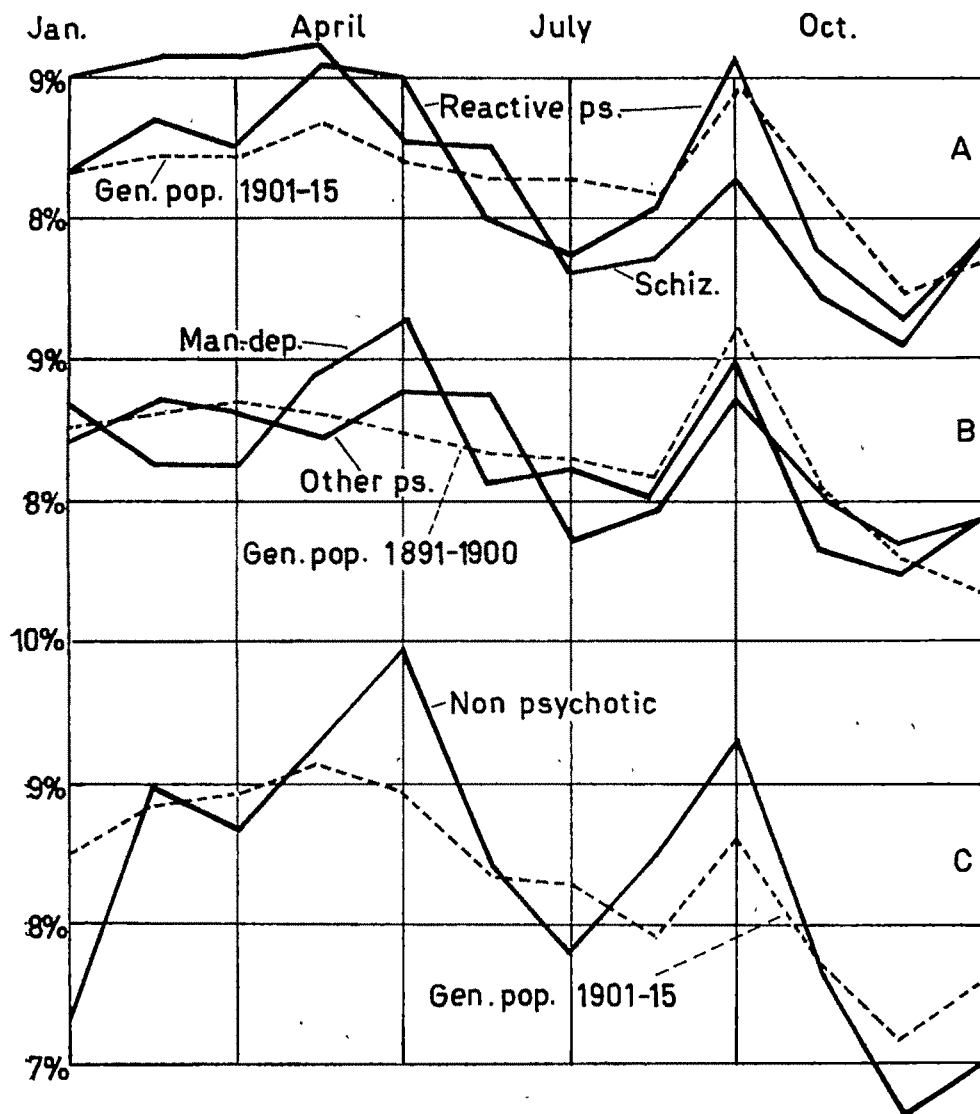


FIG. 4.—Monthly percentage distribution of births by diagnosis (the total for all 12 months = 100). Each diagnostic group is compared with the most adequate birth year group of the general population.

The small group of seamen is of interest because of the characteristic family life of this group, the father visiting the family at irregular intervals, not always at times of his own choice. Under these circumstances one would expect a disappearance of the usual monthly birth pattern, but this is not the case. Even the socially determined September maximum is of average height.

The 12-monthly pattern (Fig. 5) is some-

what irregular, owing to the small number of cases in some occupational groups. We observe an interesting April-May maximum in urban occupations with a summer vacation tradition, while this maximum does not have any parallel in such occupations as farmer, fisherman or labourer. The high September peak in farmers and fishermen is noticeable; evidently these are social groups with a tendency to preserve the old customs such as the mid-winter festivities.



TABLE III  
*Monthly birth pattern according to occupation at the time of admission. All diagnoses. For persons not gainfully employed the occupation of the head of the family is registered*

|                               |        | Number<br>of<br>cases | Jan.-May<br>birth<br>maximum | September<br>birth<br>maximum |
|-------------------------------|--------|-----------------------|------------------------------|-------------------------------|
| Labourers ..                  | 23,340 | 113.6                 | 113.5                        |                               |
| Farmers and<br>fishermen ..   | 10,628 | 129.5                 | 124.7                        |                               |
| Artisans ..                   | 5,272  | 117.3                 | 109.1                        |                               |
| Technicians,<br>chauffeurs .. | 1,782  | 111.5                 | 108.1                        |                               |
| Seamen (all ranks)            | 3,301  | 115.3                 | 112.3                        |                               |
| Clerks, shop<br>assistants .. | 5,241  | 111.9                 | 95.9                         |                               |
| Public service ..             | 3,801  | 117.4                 | 106.5                        |                               |
| Owners and<br>managers ..     | 2,553  | 118.5                 | 115.8                        |                               |
| Professional service          | 2,966  | 108.9                 | 100.0                        |                               |
| No known<br>occupation ..     | 3,250  | 115.5                 | 105.6                        |                               |
| Total ..                      | 62,134 |                       |                              |                               |

The question whether the high January-May birth maximum in schizophrenia is simply a lower class trait can confidently be answered in the negative. In the mixed but predominantly lower class group of 'labourers' the maximum is actually slightly lower than in several typical middle class groups.

#### COMMENTS

In countries where the monthly distribution of births has been registered a cyclic trend is generally observed, with a maximum during the first months of the year and a minimum in October-November. Less universal is the second maximum in September, which is, for instance, absent in the Maudsley Hospital material presented by Hare *et al.* There are variations in the amplitude of these maxima as well as in their exact location. A consistent and universal monthly birth pattern in mental disorders is therefore not likely to be found. Differences in diagnostic practice add to the problems of international comparisons. An anomalous birth distribution appears to be found mainly or only in schizophrenia, but as we known, the delimitation of this diagnostic

category varies widely from one country to another.

We can safely regard the September birth maximum as predominantly social in origin, but biological factors such as the sudden increase in food intake and alcohol consumption during the mid-winter festivities cannot be excluded. The September maximum is to a remarkable extent independent of other social factors known to influence the general birth rate, factors such as the economic depression during the 30's and the critical years of World War II. Further, the September maximum is the same in patients with mental disorders (even in schizophrenics) as in the general population. Evidently the deviating monthly birth distribution in schizophrenia does not have its origin in relatively superficial social habits such as the mid-winter traditions, but in deeper socio-biological differences between schizophrenics and the general population, differences which are somehow dependent upon seasonal variations. These differences must have existed from birth or even earlier, and must of necessity be connected with complications of pregnancy or birth.

The influence of high summer temperature is excluded by the Norwegian climate, whereas the dark and cold winter season is a definite health hazard, in particular for the newly born. In 1911-15 infant mortality in Norway varied from 47.9 per 1,000 in September to 78.6 in January. Schizophrenic patients, having survived until their hospital admission, have escaped infant mortality altogether. Our figures for monthly number of births in the general population should, therefore, be corrected for the expected number of deaths occurring during the first year of life before they can safely be compared with figures for the schizophrenics.

This correction has been carried out for the births in Norway in 1916-25 (Table IV). It is assumed that mortality during the rest of life (after the age of one year) is independent of the month of birth. There results a decrease in the January-May birth maximum in the general population from 114.4 to 113.1 per cent of the October-December minimum, because babies born in January-May have a relatively high infant mortality. The September maximum,

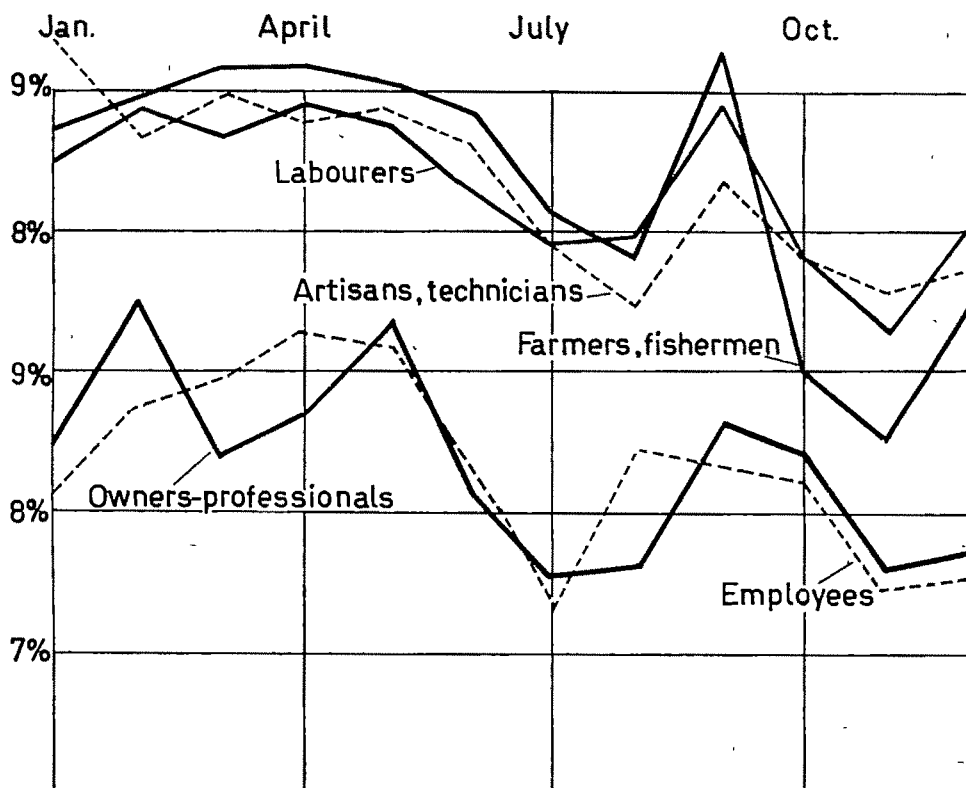


FIG. 5.—Monthly percentage distribution of births by occupation at the time of first admission for patients of all diagnostic groups (the total for all 12 months = 100).

on the other hand, goes up because of the low September infant mortality. This means that the difference between schizophrenics and the general population has probably been under-rated by the methods used in the present study.

It has been suggested that winter-born babies have parents who are indifferent or incompetent family planners, and this could increase the risk of schizophrenia in the offspring for genetic or environmental reasons. The health hazard of being a winter baby is well known in Norway by all prospective parents, and it is also common experience that winter-born babies represent more work for the mother. We are reminded, however, that there is a negative correlation between the birth rate and the January-May birth maximum, which means that the number of winter babies is relatively highest during periods with a low and presumably well planned fertility. This does not support the

hypothesis that the parents of winter-born babies represent a selection of incompetent family planners.

The most likely hypothesis is that babies born in January-May have an increased risk of sub-clinical para-natal brain damage which predisposes them to the development of schizophrenia in adult age. Epidemiological studies indicate that schizophrenics are socially handicapped for a considerable time previous to the known outbreak of their psychosis, and that this handicap is, among other things, responsible for the higher incidence of schizophrenia in the single. The personality disorders which result from minimal brain lesions are quite often similar to the 'schizoid' traits which are supposed to be over-represented in later schizophrenics. EEG findings in schizophrenia are normal or borderline, but there is a lack of good prospective studies with a long-time follow-up of individuals

TABLE IV  
The influence of infant mortality upon the monthly birth distribution of survivors

|                        | Born per<br>day in<br>Norway<br>1916-25 | Infant<br>mortality<br>per 1,000 | No. of<br>deaths<br>expected | Survivors<br>at the<br>age of<br>one year |
|------------------------|-----------------------------------------|----------------------------------|------------------------------|-------------------------------------------|
| January ..             | 174                                     | 78.6                             | 13.68                        | 160.32                                    |
| February ..            | 179                                     | 73.6                             | 13.17                        | 165.87                                    |
| March ..               | 182                                     | 74.4                             | 13.54                        | 168.46                                    |
| April ..               | 187                                     | 71.8                             | 13.43                        | 173.57                                    |
| May ..                 | 181                                     | 67.9                             | 12.29                        | 168.71                                    |
| June ..                | 173                                     | 61.7                             | 10.67                        | 162.33                                    |
| July ..                | 169                                     | 64.9                             | 10.90                        | 157.10                                    |
| August ..              | 162                                     | 60.7                             | 9.83                         | 152.17                                    |
| September ..           | 180                                     | 47.9                             | 8.62                         | 171.38                                    |
| October ..             | 161                                     | 59.3                             | 9.55                         | 151.45                                    |
| November ..            | 151                                     | 64.8                             | 9.78                         | 141.22                                    |
| December ..            | 161                                     | 69.1                             | 11.13                        | 149.87                                    |
| January-May<br>max. .. | 114.4                                   |                                  |                              | 113.1                                     |
| September<br>max. ..   | 111.5                                   |                                  |                              | 112.9                                     |

with birth complications. The clear-cut difference between schizophrenia on one side and the remaining four diagnostic categories on the other is at least not contrary to general psychopathological experience: it is a regular pattern for laboratory findings to be borderline in schizophrenia and negative in other types of functional psychosis.

#### SUMMARY

The monthly distribution of births in 62,190 psychiatric hospital patients is compared with the corresponding pattern in the general population of Norway. The number of births per day varies in a sinusoidal curve between a maximum in January-May and a minimum in October-December. There is an additional, more sharply defined peak in September, which is taken to correspond to a maximum of conceptions during the traditional mid-winter festivities.

It is shown that the January-May maximum varies from time to time in inverse relation to

the general birth date: to a birth minimum during the economic crisis of the 1930's there correspond particularly high monthly fluctuations. Any comparison between psychiatric patients and the general population should therefore be made with careful control of the years of birth.

The results of such a controlled comparison are presented, and show that schizophrenic patients have significantly higher monthly birth fluctuations than either the general population or the other diagnostic groups. The September maximum, on the other hand, is the same in all patient groups as in the general population.

These findings are consistent with the existence of some deeper socio-biological difference between schizophrenics and the general population, dependent upon seasonal variations and going back to the time of birth or late pregnancy. Sub-clinical brain damage with consequent personality disorder is suggested as the most likely pathological mechanism.

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## How Depressives View the Significance of Life Events

By ARTHUR P. SCHLESS, L. SCHWARTZ, CHRISTOPHER GOETZ and J. MENDELS

The role of a broad range of life events, especially those viewed as stressful, in the genesis of somatic illnesses or psychiatric disturbances is a subject of considerable interest. Recently attempts have been made to develop quantitative measures of life events and to explore the relationship between the 'amount' of life events and/or stress and illness in a general population (Rahe *et al.*, 1968; Rahe *et al.*, 1970): for example, The Social Readjustment Rating Questionnaire (SRRQ) (Holmes and Rahe, 1967). In the development of this scale a list of 43 life events was presented to a sample of 394 subjects. Marriage was arbitrarily assigned a value of 500, and the subjects were asked to compare the amount of relative readjustment they would anticipate from the other events. Means and item rankings (Masuda and Holmes, 1967) have been reported to be relatively consistent in groups of different age, sex, marital status, education, social class, generation American, religion, race and cultural background (Holmes and Rahe, 1967). These findings have been found reliable with patients on our unit and in a group of medical students (Mendels and Weinstein, 1972). Paykel *et al.* (1971) performed a study of weightings of a list of life events and obtained weights which were highly significantly correlated for the 14 items that were identical to those found on the SRRQ. They tested a mixed group of psychiatric patients and found that in general those events defined as 'exits' were scaled high, whereas events defined as 'entrances' had lower values.

In determining whether life events play a significant role in the aetiology of a specific syndrome it is important to know whether or not the event or events has or have some particular or unique significance to the group under consideration, or whether the group responds to these events in a similar manner to the general population. We are particularly

concerned with this problem in so far as it pertains to the syndrome of depression. To this end we have studied a group of depressed patients to determine the significance with which they view life events. We have also examined the impact of several critical factors on the depressed patients' responses. These include severity of the depression and degree of recovery from the depression, and whether or not the patient actually experienced the event or events under consideration.

### METHODS

#### *Instrument*

The 43-item list of events which constitute the SRRQ (Holmes and Rahe, 1967) was used without any significant modification. The patients were asked to state whether or not they had experienced each event, and if so when, and to weight each event relative to marriage having a weight of 50. They also completed the Depression Inventory (DI) (Beck *et al.*, 1961) to provide a quantitative index of psychopathology.

#### *Population*

Consecutive patients with the clinical syndrome of depression (Mendels, 1968) who were admitted to two in-patient units were studied. Patients with schizophrenia, organic brain syndrome, mental retardation, or any condition which disallowed the patient from understanding or responding to the questionnaire were excluded. The patients were primarily neurotic depressives with DI scores of  $22.6 \pm 10.7$  ( $\bar{X} \pm SD$ ).

#### *Procedure*

All 76 patients were tested on admission to the study and again on discharge from hospital. They completed all the study forms at one sitting.

## RESULTS

*Admission*

Depressed patients gave uniformly higher weights to the life events than did non-depressed subjects. Table I shows the mean weights for the 43 items on admission to hospital, at

discharge, together with the original weights reported by Holmes and Rahe (1967). An item-by-item comparison shows a consistent increase in weights across items (matched t-test;  $P < .001$ ). For many of the items the increase in weights was 5 to 6 times greater than the

TABLE I

| Life event                                        | H & R orig. | Weights                |        | Ranks                  |        |
|---------------------------------------------------|-------------|------------------------|--------|------------------------|--------|
|                                                   |             | Our depressed patients |        | Our depressed patients |        |
|                                                   |             | Adm.                   | Disch. | Adm.                   | Disch. |
| Death of spouse .. .. .                           | 100         | 113                    | 114    | 1                      | 1      |
| Divorce .. .. .                                   | 73          | 91                     | 81     | 2                      | 5      |
| Marital separation .. .. .                        | 65          | 75                     | 84     | 3                      | 2      |
| Jail term .. .. .                                 | 63          | 68                     | 60     | 4                      | 8      |
| Death of close family member .. .. .              | 63          | 79                     | 82     | 5                      | 3      |
| Personal injury or illness .. .. .                | 53          | 67                     | 82     | 6                      | 4      |
| Marriage .. .. .                                  | 50          | 50                     | 50     | 7                      | 19     |
| Fired at work .. .. .                             | 47          | 66                     | 64     | 8                      | 6      |
| Marital reconciliation .. .. .                    | 45          | 62                     | 57     | 9                      | 10     |
| Retirement .. .. .                                | 45          | 61                     | 57     | 10                     | 12     |
| Change in health of family member .. .. .         | 44          | 66                     | 58     | 11                     | 7      |
| Pregnancy .. .. .                                 | 40          | 65                     | 60     | 12                     | 9      |
| Sex difficulties .. .. .                          | 39          | 59                     | 52     | 13                     | 14     |
| Gain of new family member .. .. .                 | 39          | 52                     | 54     | 14                     | 17     |
| Business readjustment .. .. .                     | 39          | 57                     | 58     | 15                     | 15     |
| Change in financial state .. .. .                 | 38          | 59                     | 60     | 16                     | 13     |
| Death of close friend .. .. .                     | 37          | 47                     | 48     | 17                     | 23     |
| Change to different line of work .. .. .          | 36          | 42                     | 48     | 18                     | 28     |
| Change in number of arguments with spouse .. .. . | 35          | 51                     | 46     | 19                     | 18     |
| Mortgage over \$10,000 .. .. .                    | 31          | 61                     | 58     | 20                     | 11     |
| Foreclosure of mortgage or loan .. .. .           | 30          | 55                     | 52     | 21                     | 16     |
| Change in responsibilities at work .. .. .        | 29          | 45                     | 38     | 22                     | 26     |
| Son or daughter leaving home .. .. .              | 29          | 48                     | 50     | 23                     | 22     |
| Trouble with in-laws .. .. .                      | 29          | 34                     | 32     | 24                     | 36     |
| Outstanding personal achievement .. .. .          | 28          | 47                     | 44     | 25                     | 24     |
| Wife begin or stop work .. .. .                   | 26          | 30                     | 32     | 26                     | 38     |
| Begin or end school .. .. .                       | 26          | 40                     | 35     | 27                     | 29     |
| Change in living conditions .. .. .               | 23          | 43                     | 43     | 28                     | 27     |
| Revision of personal habits .. .. .               | 24          | 29                     | 29     | 29                     | 41     |
| Trouble with boss .. .. .                         | 23          | 37                     | 33     | 30                     | 32     |
| Change in work hours or conditions .. .. .        | 20          | 37                     | 34     | 31                     | 31     |
| Change in residence .. .. .                       | 20          | 49                     | 50     | 32                     | 20     |
| Change in school .. .. .                          | 20          | 34                     | 32     | 33                     | 35     |
| Change in recreation .. .. .                      | 19          | 35                     | 32     | 34                     | 34     |
| Change in church activities .. .. .               | 19          | 29                     | 26     | 35                     | 39     |
| Change in social activities .. .. .               | 18          | 48                     | 47     | 36                     | 21     |
| Mortgage or loan less than \$10,000 .. .. .       | 17          | 45                     | 41     | 37                     | 25     |
| Change in sleeping habits .. .. .                 | 16          | 36                     | 31     | 38                     | 33     |
| Change in number of family get-togethers .. .. .  | 15          | 33                     | 32     | 39                     | 37     |
| Change in eating habits .. .. .                   | 15          | 22                     | 23     | 40                     | 42     |
| Vacation .. .. .                                  | 13          | 29                     | 33     | 41                     | 40     |
| Christmas .. .. .                                 | 12          | 40                     | 35     | 42                     | 30     |
| Minor violations of the law .. .. .               | 11          | 21                     | 18     | 43                     | 43     |

standard error of the mean weight of that item for the comparison subjects, indicating a highly significant difference. A correlational analysis of weights assigned to items by the depressed patients on admission to hospital compared with those assigned by the normal population confirmed that the scores recorded by depressives were consistently higher across all items ( $r = 0.92$ ).

#### *Discharge*

There was no significant difference between the weights ascribed to the 43 events at admission and at discharge from hospital, even though there was considerable symptomatic change (DI scores decreased from  $22.6 \pm 10.7$  to  $9.3 \pm 8.2$ ). Indeed, there was a very high correlation between the weights for the 43 events on the two occasions ( $r = 0.97$ ).

#### *Severity and depression*

There was no correlation between average weightings of all events as scored by the patients and the severity of psychiatric symptoms (DI score). Severity of symptoms (DI scores) influenced the ratings of only three of the 43 items (a finding which could be due to chance): 'Change in Living Conditions', 'Mortgage over \$10,000' and 'Sexual Difficulties'.

#### *Age*

Age of the patients did not appear to affect the findings. It correlated inversely with only two items: 'Christmas' and 'Business Re-adjustment'.

#### *Rank order*

Examination of the rank assigned by the depressed patients and by the Holmes and Rahe comparison group to the individual items showed that the depressives considered events to have the same relative order of importance as did a normal population. On admission, 5 items were increased by more than five places in rank order, while 7 decreased. On discharge, 6 events were moved up in importance while 7 were lowered.

It is of interest to note that the items which increased in rank order on admission or discharge included four pertaining to financial

matters ('Change in Financial State', 'Mortgage Greater than \$10,000', 'Foreclosure of Mortgage', and 'Mortgage Less than \$10,000'). Also ranked higher were changes in residence and in social activities.

#### *Reliability*

We compared 14 of our items with items which Paykel used in comparing his findings with those of Holmes and Rahe; namely, 'Death of Spouse', 'Divorce', 'Jail Term', 'Death of Close Family Member', 'Personal Injury or Illness', 'Marriage', 'Marital Reconciliation', 'Being Fired', 'Retirement', 'Death of a Close Friend', 'Change in Line of Work', 'Trouble with the Boss', 'Change in Schools', and 'Minor Law Violation'. The correlation coefficient between the two sets of items was 0.66, which is almost the same as the correlation which Paykel found (0.68) in comparing his findings with those of Holmes and Rahe.

#### *Effect of experienced life event on weight assigned*

We determined the effect that experiencing a particular event had on the weight which the patient assigned to that event. We compared the weights for each item between those subjects who reported experiencing that event and subjects who had not experienced that event. The procedure was repeated for both admission and discharge scores. The majority of weights were not influenced by whether or not the subjects had experienced the events, i.e., the majority of the items were given the same weight regardless of whether or not the patient had experienced the event. Table 2 shows the few items for which significantly different weights were obtained. Further analysis was performed to determine whether, for those individuals who experienced an event, weights assigned on admission and discharge differed. Only two items reflected such a difference, 'Sexual Difficulties' and 'Change in Responsibilities at Work', both of which were weighted higher on admission. Again, the relatively small number of items affected is noteworthy. A similar analysis comparing admission and discharge weights for people who have not experienced the event revealed no differences among weights on any item.

TABLE II  
Items in which experiencing event influenced weighting of events

| Event                                      | Admission          |                |                        |                | Discharge          |                |                        |                |
|--------------------------------------------|--------------------|----------------|------------------------|----------------|--------------------|----------------|------------------------|----------------|
|                                            | Experiencing event |                | Not experiencing event |                | Experiencing event |                | Not experiencing event |                |
|                                            | Number             | Average weight | Number                 | Average weight | Number             | Average weight | Number                 | Average weight |
| Change in health of family member .. .. .  | 6                  | 181            | 70                     | 56             |                    |                |                        |                |
| Change in responsibilities at work .. .. . | 13                 | 73             | 63                     | 39             |                    |                |                        |                |
| Trouble with in-laws .. .. .               | 6                  | 78             | 70                     | 30             |                    |                |                        |                |
| Change in church activities*               | 22                 | 39             | 54                     | 25             | 22                 | 40             | 54                     | 20             |

\* Difference for this item significant at 5 per cent level. All other items significant at 1 per cent level.

#### *Effect of clinical improvement on scoring*

The effect of clinical status on the scoring of items was investigated by examining those items which were rated significantly differently by patients who had improved the most as compared with the patients who improved the least. Improvement of depression was gauged by changes in the DI. Only three items were involved, indicating the slight effect that clinical improvement (as reflected by this measure) had on this system. 'Trouble with Boss' was rated higher by patients who recovered from their depression, while patients who improved the least scored 'Wife Began or Stopped Working' and 'Change in Work Hours' significantly higher.

#### *Sex*

The scores assigned by the patients, both at admission and at discharge, were independent of sex of the respondents.

#### COMMENT

Our findings indicate that non-psychotic depressed in-patients view a wide variety of events as involving a significantly greater readjustment than do non-depressed subjects. The general persistence of the higher weights on discharge from the hospital when the patients had significantly less symptoms, as well as the independence of the weights from severity of the symptoms suggests that, in our

patients at least, the increased weights are not a transient phenomenon. We cannot determine at this time whether this phenomenon is the result of the clinical depression or perhaps reflects some aspect of the personality of individuals who develop a clinical depression. Longitudinal study of depressed subjects during symptomatic and asymptomatic periods will be required to explore this association further. We are particularly intrigued at the possibility that this might reflect some enduring aspect of the personality of individuals who develop clinical depression.

This possibility is also supported by the finding that there was a fairly uniform increase in the weights ascribed to all 43 items, indicating that the depressed patients do not seem to select particular items as especially stressful. Paykel has suggested that 'exits' may be more significant in *causing* depression than 'entrances' (Paykel *et al.*, 1969; Paykel *et al.*, 1971). However, we found that events of both categories increased, with the exception of marriage (entrance) which dropped considerably in rank order. However, the score for marriage was fixed in our scaling system, so its lower rating is probably the result of the fact that it was bypassed by the higher weights given to the other items.

It is of interest to speculate on why the patients did not give proportionately greater increases to the exits than to the entrances

either when they were depressed or on recovery. It may be that the exits were in the main already rated higher than entrances and so differentiated to a maximal extent. An alternative explanation is to consider depression to be exerting an 'alarm type reaction' in which the patient views *all* events as being more threatening, reflecting a reduced ability to adapt to change of any kind in these people.

It is also of interest to note that whether or not the patient experienced the item did not in most cases influence the weight ascribed to it. An analysis of the data revealed that sufficient patients did actually experience the events (with the exception of 'Death of Spouse', 'Divorce' and 'Jail Term') to make this conclusion statistically meaningful. This also suggests the possibility that the depressed patient's responses reflect a more inherent characteristic. This obviously requires further investigation.

Our results provide evidence that a diagnostic group, i.e., depression, does distinguish subjects who score items differently from control subjects, although the ranking of the items remains consistent. It would be of interest to determine whether scores for depressed patients are consistent over the groupings investigated in the literature, such as ethnic group, generation American, social class and cultural background. It is important to note that our finding derives from a group of in-patients with a moderate neurotic depressive illness. It remains to be determined whether this observation applies to other subtypes of depression.

#### SUMMARY

Neurotic depressed in-patients were found

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to view life events as uniformly more stressful than a comparison group of non-depressed subjects. The weights ascribed to the 43 individual life events which were examined were independent of patient's age, sex, severity of depression, whether he had experienced the event or not, and symptomatic improvement.

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# Life Crisis, Social Diagnosis, and Social Therapy

By J. K. W. MORRICE

In a previous paper (Morrice, 1973a) an account was given of a day hospital run as a therapeutic community. Emphasis was laid upon the way staff had learned to diagnose and treat patients not only according to conventional labels but also in terms of their disturbed social relationships—so-called social diagnosis and social prescription. At that time also an attempt was begun to identify life events which appeared to have precipitated the patients' referral to psychiatric care. This paper considers the data derived from 266 consecutive admissions to the day hospital. Information obtained in each case was discussed by the staff group and noted on a standard form (Fig. 1) according to agreed principles.

## Crisis leading to referral

Tables I and II show the number and nature

TABLE I

| No. of crises identified in each case | No. of admissions in each category |
|---------------------------------------|------------------------------------|
| None                                  | 7                                  |
| One                                   | 259                                |
| Two                                   | 157                                |
| Three                                 | 56                                 |
| Four                                  | 18                                 |

TABLE II  
*All crises identified*

| Nature of crisis               | Number | Per cent |
|--------------------------------|--------|----------|
| A. Interpersonal difficulty .. | 249    | 51       |
| B. Antisocial behaviour ..     | 30     | 6        |
| C. Financial problem ..        | 35     | 7        |
| D. Work problem ..             | 110    | 22       |
| E. Physical illness ..         | 22     | 4        |
| F. Accident ..                 | 4      | 1        |
| G. Pregnancy ..                | 8      | 2        |
| H. Bereavement ..              | 27     | 6        |
| I. Other ..                    | 5      | 1        |
| Total ..                       | 490    | 100      |

of the crises found. It proved possible to identify a crisis in all but seven of the 266 admissions. Altogether 490 crises were discovered, the majority falling into two categories: (1) Interpersonal difficulties in the family, and (2) Work problems. Table III indicates the relationship

TABLE III  
*Family members involved in crisis A: Interpersonal difficulty*

| Persons identified                                                                                    | No. of involvements | Per cent |
|-------------------------------------------------------------------------------------------------------|---------------------|----------|
| Spouse alone ..                                                                                       | 44                  | 9        |
| Spouse together with another family member ..                                                         | 105                 | 21       |
| Father alone ..                                                                                       | 2                   | 0.5      |
| Father together with another family member ..                                                         | 67                  | 14       |
| Mother alone ..                                                                                       | 8                   | 1.5      |
| Mother together with another family member ..                                                         | 75                  | 15       |
| Father-in-law (all involvements) ..                                                                   | 2                   | 0.5      |
| Mother-in-law (all) ..                                                                                | 11                  | 2        |
| Son (all) ..                                                                                          | 33                  | 6.5      |
| Daughter (all) ..                                                                                     | 38                  | 8        |
| Brother (all) ..                                                                                      | 18                  | 3        |
| Sister (all) ..                                                                                       | 16                  | 3        |
| Others (includes boyfriends, girlfriends, step-parents, other in-laws, and more distant relatives) .. | 79                  | 16       |
| Total ..                                                                                              | 498                 | 100      |

of those involved in the first category. The spouse alone, or together with another family member, was involved a total of 149 times (30 per cent). Mothers-in-law were involved in only 11 crises (2 per cent). No particular constellation of family members appeared significantly often to be worthy of comment.

## Social diagnosis and social prescription

It was possible in all 266 admissions to make formulations of symptoms and problems accord-

Crises Leading to Referral (Circle identifying letter of EACH crisis — place identifying number of EACH person involved in relevant space)

|                             | Others in Order of Involvement |  |  | Code for Persons Involved |
|-----------------------------|--------------------------------|--|--|---------------------------|
| A Inter-personal Difficulty |                                |  |  | 0 Spouse                  |
| B Anti-social Behaviour     |                                |  |  | 1 Father                  |
| C Financial Difficulty      |                                |  |  | 2 Mother                  |
| D Work Problem              |                                |  |  | 3 Father-in-law           |
| E Physical Illness          |                                |  |  | 4 Mother-in-law           |
| F Accident                  |                                |  |  | 5 Son(s)                  |
| G Pregnancy                 |                                |  |  | 6 Daughter(s)             |
| H Bereavement               |                                |  |  | 7 Brother(s)              |
| I Other (specify) _____     |                                |  |  | 8 Sister(s)               |
|                             |                                |  |  | 9 Other _____             |

\_\_\_\_\_ "X" in above signifies Police/Judiciary involvement.

Social Diagnosis \_\_\_\_\_ Social Prescription \_\_\_\_\_

FIG. 1.—Relevant section of Day Patient Contact and Data Summary.

ing to this model. In the beginning there was difficulty, particularly on the part of nursing staff, and a tendency to resort to clichés such as 'unresolved conflict with parents' or 'difficulty in socializing'. Completing these sections proved more useful in staff training than in data collecting. But a greater familiarity with the terminology of role-playing, role-relationships and the psychopathology of families brought a clearer definition of the patients' psychosocial problems and of treatment goals and methods.

#### *Social therapy*

The social prescription was fulfilled in a treatment regime placing reliance on group methods, a multidisciplinary team approach, and full participation of patients in matters of consequence to them. Nurses were heavily involved as therapists, taking part in group psychotherapy, work therapy, marital therapy, and encounter groups. Relatives were almost always involved, and formal marital or family therapy was given to over 20 per cent of the patients in this study. Details of treatment methods and results may be found elsewhere (Morrice, 1973a, b). Assessment of treatment effectiveness gave an overall rate of 68 per cent.

The treatment programme outlined has limited but fairly well-defined goals. The latter follow logically from identification of the patient's social crisis and his disturbed social

relationships. It is not suggested that the regime works well for everyone: some patients cannot see the point of it all and some relatives refuse to co-operate. But the attempt to deal with psychosocial disturbance by psychosocial therapy appears relevant and beneficial for a wide range of patients.

#### DISCUSSION

Studies accumulate to demonstrate a greater incidence of crises in the lives of patients compared with controls, and also that critical events contribute to psychiatric breakdown and referral to hospital (e.g. Birley and Brown, 1970; Uhlenhuth and Paykel, 1973). The work of others (e.g. Caplan, 1964; Langsley and Kaplan, 1968; Jones and Polak, 1968) gives credence to the notion of social crisis as a precipitant of mental illness and emphasizes the value of intervention which takes full account of social relationships. The present study supports such views, indicating a high incidence of identifiable crises in referrals to a day hospital and confirming the suitability of a psychosocial approach in therapy.

#### ACKNOWLEDGEMENTS

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## The Effects of Small Electrical Currents upon Depressive Symptoms

By D. K. B. NIAS and M. B. SHAPIRO

Lippold and Redfearn (1964) reported psychological effects from sending small direct electrical currents through the brain (polarization). For 26 subjects they found that scalp-positive current caused 'alertness or more involvement in the environment', whereas scalp-negative current caused 'quietness and withdrawal' (p. 771). Three other subjects reliably produced opposite changes. The observations were made during brief talks by judges unaware of the kind of current being administered. The present study, details of which are given by Nias (1968), aimed to observe the effects of polarization upon symptoms of depressed patients.

The apparatus consisted of a transistorized circuit with two electrodes placed closely along the top of each eyebrow and another two electrodes attached to the right leg. This permitted, in addition to the positive and negative conditions, a placebo in which current flowed between the two eyebrow electrodes and between the two leg electrodes. Experiments were conducted on two subjects. Subject 1 was a 37-year-old introverted man who had been an in-patient for nine years and was considered to be suffering from atypical depression with underlying schizophrenia; his medication consisted of isocarboxazid 10 mg. b.i.d., imipramine 25 mg. b.i.d., chlorpromazine 25 mg. t.i.d. and 100 mg. nocte, and lithium citrate 30 grains nocte. Subject 2 was a 57-year-old extraverted ex-U.S. Air Force officer who had been disabled by chronic depression and alcoholism for three years; he was taking chlorthalidopoxide 10 mg. t.i.d., trimipramine 25 mg. t.i.d., and ethchlorvynol 2 tab. nocte. The subjects were asked to participate in research on treatment that would involve the use of a placebo.

The preliminary stage of each investigation consisted of three- or four-hour trials (one per day) comparing positive with negative current. The placebo condition was then to be substituted for the current that appeared to make the subject worse. A double-blind procedure was used throughout. The subjects assessed the intensity of their symptoms, for the previous half-hour, immediately before and after each trial by means of the Personal Questionnaire (Shapiro *et al.*, 1973). In the preliminary experiment, Subject 1 tended to worsen during positive and improve during negative current. Two 20-trial experiments were then conducted, one at 400 microamp., the other at 500 microamp., each involving the random alternation of negative current with placebo. Subject 2 was involved only in a preliminary 500 microamp. experiment.

The results were summarized using a method (Shapiro *et al.*, 1973) that takes into account the number of opportunities for improvement and worsening; a symptom is excluded if there are less than three opportunities for either. The percentage of actual worsenings is subtracted from the percentage of actual improvements to give a 'net per cent index'. Table I gives the results for the 400 microamp. experiment for Subject 1 (the results from his other experiment showed the same general tendencies) and for the preliminary experiment for Subject 2. The results show that Subject 1 tended to improve with negative current, while in contrast Subject 2 improved with positive current.

We do not know whether medication interacted with the currents to affect the results. Regarding the double-blind, the subjects could distinguish, slightly better than chance, between the experimental conditions when alternated

TABLE I  
Comparison of current effects for two patients

| Symptoms                                   | Net per cent indices |          |            |
|--------------------------------------------|----------------------|----------|------------|
|                                            | Negative current     | Placebo  | Difference |
| Subject 1 (20 trials)                      |                      |          |            |
| I feel I can't go on living properly .. .. | 70                   | -9       | 79         |
| The pain in my groin worries me .. ..      | 80                   | 30       | 50         |
| My concentration is bad                    | 60                   | 10       | 50         |
| I can't link up with other people .. ..    | 40                   | -10      | 50         |
| I feel scared of people ..                 | 20                   | -10      | 30         |
| I have a gnawing pain in my groin .. ..    | 50                   | 21       | 29         |
| I feel inferior to other people .. ..      | 7                    | 10       | -3         |
| Subject 2 (14 trials)                      | Positive current     | Negative | Difference |
| I feel very restless ..                    | 67                   | -43      | 110        |
| I've been feeling very bored .. ..         | 86                   | -12      | 98         |
| I feel depressed .. ..                     | 66                   | -32      | 98         |
| I've been dwelling on my problems .. ..    | 71                   | -26      | 97         |
| I feel irritable .. ..                     | 47                   | -7       | 54         |
| I can't think things through at all ..     | 3                    | -36      | 39         |

in the same session; negative current produced a slight tingling on the forehead and was seen as the therapeutically effective agent by both subjects. However, they denied having noticed these differences in the main experiment, in which at least 20 hours separated each session. Finally, neither subject showed an improving or worsening trend over the whole period of the investigation. The results in Table I thus indicate that small direct currents passed through the brain have temporary effects upon symptoms similar to the effects observed by Lippold and Redfearn on 'alertness' and 'quietness'.

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## Bipolar Manic-Depressive Psychosis in Early Adolescence A Case Report

By IAN BERG, ROY HULLIN, MICHAEL ALLSOPP, PATRICK O'BRIEN and  
ROBERT MACDONALD

A girl is briefly described who had typical bipolar manic-depressive psychosis starting unusually early at 14 years of age. Symptoms at the time of onset included severe anorexia, school phobia and attempted suicide, about the time of onset. She required unusually high doses of lithium carbonate to obtain adequate plasma levels, and there was a tendency for the administration of antidepressant medication to cause her to switch rapidly from depression to hypomania. The last two findings were shared by her father who also had bipolar manic-depressive psychosis.

### CASE REPORT

*Onset.* The patient, a tall girl of normal physical appearance, was apparently well until her fourteenth birthday. About this time she began to diet, and her anorexia became so severe that she lost about three stones in weight within three months. Her periods, which had been regular for a year, ceased. During this time she had remained cheerful and socially active, but then, over a few days, she became miserable, gave up many of her interests and stopped seeing her friends; this was in the summer holidays. When term began she became apprehensive and tearful and could not be persuaded to go to school. She then expressed suicidal ideas and swallowed some acetone, which led to her being admitted to a general hospital.

*Manic depressive illness.* Admission to a psychiatric unit for adolescents followed shortly afterwards. She was profoundly miserable and showed severe psychomotor retardation. There was no other symptom of adult type depression, however, such as diurnal variation of mood. This depressed state persisted unchanged for a month. Then over a couple of days and following the administration of amitriptyline she became markedly elated, excessively cheerful and overtalkative and showed flight of ideas. She was generous, flirtatious and irritable. This hypomanic state persisted for several weeks. During this time she was transferred to an M.R.C. Metabolic Research Unit.

Subsequently, she became depressed again for a week or two at a time on three separate occasions. Twice, she changed rapidly back to hypomania after taking tryptophan. The hypomanic episodes lasted several months and did not respond to lithium treatment. A few days of apparent normality were sometimes interspersed between these attacks. She was transferred to an adult ward of

another psychiatric hospital. There, the use of ECT appeared to help her condition, but she remained mildly depressed and showed some manipulative behaviour involving tempers and absconding over the next few months. Some of her difficulties seemed to stem from excessively high parental standards.

*Psychological testing* when she was at her most normal revealed at least average intelligence and a moderate degree of neuroticism. Scores on a depression rating scale were in keeping with her mood at the time of administration.

About a year and a half after the onset of her disorder she appeared reasonably normal, was discharged home and was able to return to school. A few months later, however, there was another severe depressive episode.

*Lithium treatment.* It was necessary to administer 2.4 G of lithium carbonate a day to obtain a consistent plasma level of 1 meq/l. (estimated by an atomic absorption spectrophotometer).

*Family history.* Father, a professional man in his early 40s had suffered from recurrent severe depressions since age 26 and had had at least one hypomanic episode. He had been considered a bipolar manic-depressive and had apparently responded to lithium treatment. He too required two to three times the dose of lithium carbonate, normally used in over a hundred patients coming to the same clinic, to achieve satisfactory plasma levels.

### COMMENTS

Manic-depressive psychosis does not appear to occur under the age of 11 and is unusual in early adolescence, although several well-defined examples have been recorded in the 12-15 year age group (Anthony and Scott, 1960). The illness of the girl reported began with three typical adolescent problems, anorexia nervosa (Leader, 1971b), school phobia (Berg, 1970) and attempted suicide (Henderson, McCulloch and Phillip, 1967; Leader, 1971a), all three of which have been attributed to affective disorders. The subsequent development of manic-depressive psychosis in our case strengthens this connection. The occurrence of manic-depressive psychosis in the bipolar form in father and daughter is in keeping with what is already known about the family incidence of this condition. Their shared idiosyncrasy with regard to lithium dosage may be a genetically associated physical characteristic, similar

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to colour blindness, which although not operative in this instance, has been known to be-linked to manic-depressive psychosis in this sort of way (Leader, 1973).

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## Synopses of Papers Awaiting Publication

### **Psychiatric Morbidity in a Sample of a London Coroner's Open Verdicts.** By T. A. HOLDING and B. M. BARRACLOUGH.

A coroner concludes an open verdict if there is insufficient evidence to record any of the other verdicts. In practice open verdicts are more often used for cases in which it is impossible to decide whether the death was an accident or suicide. They are therefore of interest to doctors and social scientists because suicides may be so classified for want of evidence of intent to die.

One hundred and thirty-four open verdict deaths occurring during 1969 and 1970 in the Inner West London Coroner's District have been surveyed for evidence of mental illness recorded in the inquest notes. For 110 (82 per cent) of these deaths the probable verdicts were suicide or accident and would be classified as 'undetermined deaths' by the Registrar General. Of these deaths 73 per cent were diagnosed as mentally ill before death, 54 per cent were receiving medical treatment for psychological symptoms before death, 42 per cent had a history of psychiatric treatment and 24 per cent had made a previous suicide attempt. In these respects undetermined deaths and suicide deaths resemble each other; both are drawn predominantly from the mentally ill.

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### **Subjective and Erectile Responses to Complex Erotic Stimuli in Homosexual and Heterosexual Males.** By MATIG MAVISSAKALIAN, EDWARD B. BLANCHARD, GENE G. ABEL and DAVID H. BARLOW.

Erections were measured concomitantly with subjective reports of sexual arousal and of pleasantness in six homosexual and six heterosexual males. The stimuli used were two minute video tapes of four different sexual activities: (1) a single, provocative nude female; (2) two females engaged in lesbian behaviour; (3) heterosexual intercourse; and (4) two males engaged in homosexual behaviour.

The homosexual group responded with significantly greater erections and subjective sexual arousal to the heterosexual and homosexual films than to the single

girls or lesbian ones. The heterosexual group's sexual response to the homosexual films was significantly lower than to the single girl, lesbian, or heterosexual ones which did not differ. The heterosexuals rated the homosexual stimulus as unpleasant, whereas homosexuals rated the heterosexual cues as mildly pleasant. The lesbian and homosexual films significantly differentiated the two groups on all three dependent measures. Ten out of twelve subjects showed significant individual correlations between erection and subjective reports of sexual arousal. Correlation coefficients for the entire group between erection-subjective reports of sexual arousal, erection-pleasantness, and subjective reports of sexual arousal-pleasantness were all significant.

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### **Subjective Age in Chronic Schizophrenia: Evidence for a Sub-Group of Patients with Defective Learning Capacity?** By T. J. CROW.

It is generally held that an impaired capacity for new learning is characteristic of the organic states rather than of the functional psychoses. The present observations suggest, however, that between 5 and 25 per cent of long-term hospital in-patients admitted with a diagnosis of schizophrenia, among other disabilities, may have a defective capacity for acquiring new information.

In a survey of 237 chronic male in-patients it was found that 60 patients (25.3 per cent) believed themselves to be five or more years younger than they really were; 26 patients believed themselves to be within five years of their age at admission, although they were a mean of 28 years older than this. A  $\chi^2$  comparison of this figure with the number to be expected on the basis of the hypothesis that the patients were merely guessing their age as a figure between 0 and their true age produced a highly significant disconfirmation of this hypothesis ( $\chi^2 = 46.40$ ; d.f. 6;  $p < 0.001$ ). Twelve patients (5.2 per cent of the total sample) estimated their age to be within one year of their age on admission.

These results show that approximately one quarter of long-term in-patients with a diagnosis of schizophrenia systematically underestimate their own ages in a manner which suggests that some, from early in

the course of their disease, have failed to record the passage of time, while others have lost this ability at a later stage.

These findings are interpreted as suggesting that within the group of patients suffering from chronic schizophrenia there may be a sub-group in whom severe deficits of new learning capacity co-exist with other gross psychiatric disabilities. The investigation provides a simple method of identifying such patients for further study.

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**Overinclusive Thinking in Mania and Schizophrenia.** By N. J. C. ANDREASEN and PAULINE S. POWERS.

Thirty-one patients, 15 schizophrenics and 16 manics, were evaluated for overinclusive thinking, using the Payne battery, and these were compared with 15 normal controls. Boty types of patients were carefully selected, using predefined diagnostic criteria. Patients with prominent affective symptoms or full remission were not included in the schizophrenic category. Manics showed significantly more evidence of overinclusiveness than did the schizophrenics on two out of three tests in the Payne battery (proverb interpretation and the Goldstein-Scheerer test). The object classification test did not differentiate the two groups. The manics also scored significantly higher on overinclusiveness than did the normal controls, while the schizophrenics tended to be underinclusive as compared to the control group. These data suggest that overinclusive thinking is not specific to schizophrenia and that it may be more characteristic of mania than of schizophrenia.

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**Self-Mutilation, Obsessionality and Narcissism.**

By A. R. GARDNER and A. J. GARDNER.

A controlled study of 22 non-psychotic female habitual self-cutters showed that the mean age at which the behaviour commenced was 23.9 years, range 9 years to 56 years. Fourteen made their first cut in hospital, 8 outside hospital. In all cases the wrists and forearms were the site of choice, though some cuts were made elsewhere on the body. The main reason volunteered for this behaviour was relief of tension.

Comparison with non-cutting controls showed the only significant difference to be the cutters' more frequent exhibition of psychosexual disorder. The narcissistic qualities of these patients were also noted.

The use of the Middlesex Hospital Questionnaire and the Obsessive-Compulsive section of the Tavistock Inventory confirmed the clinical impression that these patients were markedly obsessional. This marked obsessionality, combined with a tendency to experience recurrent episodes of distressing tension, suggested ways in which relaxation and aversive techniques (so far untried in the management of these patients) could be applied. The theoretical basis for the potentially successful use of such techniques in self-mutilating patients is discussed, and it is concluded that in the notoriously difficult treatment situation such patients present the new application of techniques of established value in other therapeutic fields is worth serious consideration.

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**A Study of Minor Psychiatric and Physical Symptoms During the Menstrual Cycle.**

By P. J. V. BEUMONT and M. G. GELDER.

Two groups of subjects were studied by the use of a daily questionnaire and check list to determine whether psychological and physical symptoms were related to phases of the menstrual cycle. The first group consisted of 25 women who menstruated normally. These subjects reported more symptoms during the premenstrual and menstrual weeks. The second group consisted of 7 women who had previously undergone simple hysterectomy with conservation of the ovaries, and in whom normal endocrine changes of the menstrual cycle were demonstrated. In this latter group no significant variation in symptoms during the cycle could be discerned.

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**Is Unilateral ECT Less Effective Than Bilateral ECT?** By GIACOMO D'ELIA and HEINO RAOTMA.

While there is a general agreement about the advantages of unilateral ECT as concerns memory effects and post-treatment confusion, some authors report the impression of a lower therapeutic efficacy of unilateral ECT as compared with bilateral ECT.

However, a review of the studies published so far shows that neither differences in immediate antidepressant efficacy nor differences at follow-up are apparent. Studies in which patients were treated with the alternative treatment method (bilateral or unilateral ECT), as their own controls, did not show any difference in antidepressant efficacy or in number of treatments. Further, the two treatment methods were equally effective in severe depression. It is emphasized that unilateral ECT requires adequate technique in order to produce maximal seizure activity and antidepressant efficacy.

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**Personality Characteristics of Alcoholic and Depressed Patients.** By DAVID M. SHAW, DAVID A. MACSWERNEY, ANTHONY L. JOHNSON and JULIUS MERRY.

A personality questionnaire, incorporating 'Psychoticism' (P), 'Neuroticism' (N), 'Extraversion' (E) from the PEN scale and 'Validity' (probably a measure of 'psychic energy') from the Marke-Nyman Temperament Scale, was given to primary alcoholic and to depressed subjects. The latter were tested both when they were ill and when they had recovered. The results suggested that alcoholics were lacking in 'drive', had little emotional stability and might have had sociopathic traits. The ill depressives had high P scores which returned to normal on recovery. The observed changes in N, E and V associated with the illness in depressed subjects, and the low V values seen in these patients after recovery confirmed earlier findings and illustrated the dependence of the responses on the affective state of the patients. The alcoholics resembled the recovered depressives in that both had low scores on V. They differed from them in that the alcoholics had high N scores compared to the values in recovered depressives, which were similar to those of the controls.

In the sample of alcoholic and depressed individuals in this study N and E were uncorrelated and were assumed to be independent. V was related to N and E in a way which indicated that the most energetic members of the groups studied might also have been the most emotionally stable and the most extraverted.

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**Self-Destructive Behaviour in Oral and Intravenous Drug Dependent Groups.** By M. R. GOSSOP, J. P. COBB and P. H. CONNELL.

Although the higher mortality rate among heroin addicts is well documented, comparatively little is known about self-destructive behaviour in this group. Also, few studies have been made of subjects dependent upon oral drugs. In a study of self-destructive behaviour among 97 patients at a drug dependence unit, two main variables were investigated. These were self-injury and self-poisoning. The results show that there was a higher incidence of self-injury within the orally dependent group than the intravenous group. On the self-poisoning variable, there was no difference between these two groups, although the incidence of self-poisoning was high for both. There was a significant positive correlation between self-injury and overdosing in the oral group, but not in the intravenous group. The results show no correlation between sex and self-injury. Three subjects, each of whom had a history of self-destructive behaviour, were known to have died from overdoses since the beginning of the study. It is suggested that the pharmacological action of the drugs abused by the two groups may account for differences in self-injury, although personality factors may also be involved. Finally, it is suggested that the risk to life associated with self-destructive behaviour in drug dependent individuals, must be taken seriously.

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**The Male : Female Ratio Among the Siblings of Delinquents.** By R. V. G. CLARKE and P. SOFTLEY.

Analysis of the family backgrounds of several samples of approved school boys revealed that the boys had many more brothers than sisters: 118 boys to 100 girls, compared with a normally occurring birth ratio of 106 boys to 100 girls. These results suggested that a preponderance of male siblings might be related to delinquency. To test this hypothesis, the family backgrounds of other delinquent groups were examined. Although a previous study reported that male prisoners in Australia came from families where there were considerably more boys than girls, the excess of males was almost entirely the artificial result of including the sampled cases. The ratios of brothers to sisters (sampled case excluded) for borstal boys, boys committed to senior detention centres, girls in a remand home, and girls committed to approved

school showed no disproportion in the number of male siblings. Nor did the ratios of brothers to sisters in a large sample of boys living in one part of London relate to their self-reported offending. It was therefore concluded that the disproportion of brothers to sisters for the approved school boy population probably reflects factors taken into account in the committal decisions.

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#### **Social Aspects of the Battered Baby Syndrome.**

By SELWYN M. SMITH, RUTH HANSON and SHEILA NOBLE.

A controlled investigation of 214 parents of battered babies shows that pre-marital pregnancy and illegitimacy, absence of the child's father, marital disharmony and rejecting attitude towards the child are precursors of baby battering. Battered babies are likely to be reared in broken homes and are at risk of social maldevelopment and death. Ineffectiveness and distrust of contraception by these parents suggests that various birth control measures are likely to be ineffective in reducing the prevalence of baby battering.

Battering parents compare reasonably with other low social class groups, in their standards of income and weekly food expenditure. Housing is in some respects worse. Improvement in material benefits without regard to the parents' personality deficiencies is therefore unlikely to affect the increase in the number of battered babies. Social isolation is a characteristic of these parents and reflects their unhappy childhood. Lack of kinship support was

particularly important among the non-white parents. Treatment can be supportive only, and prevention must lie in effective education of the next generation and in possible changes in the law relating to child care.

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#### **Pornography, The Law and Mental Health.**

By F. E. KENYON.

After a brief review of recent surveys and reports the problems over definitions and further classification of pornographic and obscene writings are discussed. The important socio-cultural variables are described, followed by an account of the legal position, with particular reference to the Obscene Publications Acts 1959 and 1964, recent legal decisions and possible future legislation. The main psychopathological features of pornography are detailed, as well as six general theories of its postulated effects; these are summarized as cathartic, aversive, stimulant, corruptive, liberating and no important effects. The special cases of children, the immature, and the mentally disordered are further considered and the many important variables often neglected in research. It is concluded that on present evidence pornography does little harm to mental health but can be offensive to many people. It is suggested that instead of further restrictive legislation a better policy would be increased education, with pornography regarded simply as being in rather poor taste.

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## Book Reviews

### PRESENILE DEMENTIA

**Dementia in the Presenium.** By ANDREW EDMUND SLABY and RICHARD JED WYATT. Springfield: Charles C. Thomas. 1974. Pp. xi+214. Index 8 pp. Price \$12.75.

This book was compiled by two psychiatrists working in the Laboratory of Clinical Psychopharmacology at the National Institute of Mental Health, Washington, D.C. While reviewing the literature on the presenile dementias preparatory to a biochemical investigation the authors were unable to find a practical synopsis of these conditions, including an account of any feasible treatment. In filling this gap, they deal not only with the presenile dementias in the narrow sense of the term, but include some 60 disorders in the course of which dementia, or even pseudo-dementia, may manifest themselves between the ages of 20 and 64.

Comprehensive accounts, including the results of recent research are given of the presenile dementias. The other conditions are dealt with more briefly, but for them also the most important contributions to the literature are given: the bibliography section fills over 37 pages. There are a number of charts concerning nosology, and others summarising in tabulated form clinical features, pathology, and laboratory findings. The ways in which many conditions can be recognised early and treated with at least moderate success are stressed.

Here and there criticisms could be made, e.g. of a faulty definition of 'occupational delirium', or of a rather too cursory and uncritical section on the use of psychological tests. The book may, however, be useful to candidates preparing for postgraduate examinations or to psychiatrists wishing to bring themselves up-to-date.

FELIX POST.

### PSYCHODYNAMICS

**The Psychoanalytic Study of the Child, Volume 28.** Edited by ANNA FREUD, R. ESSLER, M. KRIS and A. SOLNIT. London: The Hogarth Press and the Institute of Psychoanalysis. 1973. Pp. 511. Index 19pp. Price £6.00.

The first volume of this series, which among other things contained René Spitz's article on hospitalism, was published in 1945. Every year since then a new volume has appeared which has provided a useful

source of information for those not otherwise in touch with what is going on in psychoanalytic circles. The 1973 volume, pleasingly printed and produced, contains several papers of interest, although it lacks excitement. The great days have perhaps passed. Two of the authors in Volume 1 have this year written obituaries, Lawrence Kubie on Bertram Lewis, also an author in Volume 1, and Eleanor Pavenstedt on Marian Putnam. Dorothy Burlingham has a paper in both volumes. The only topic common to both volumes is the primal scene, written about by Marie Bonaparte in Volume 1 and reconsidered in this volume by Aaron Esman, who questions whether the witnessing of parental intercourse is as damaging to the child's development as it has sometimes been supposed to be. Several papers discuss theoretical issues, several report cases.

Only two papers report systematic observations. Dorothy Burlingham fills in part of the remarkable gap in knowledge about the development of infant-father relationships. Fathers mother, it seems, and stimulate, and sometimes arouse, discomfort and anxiety. Present-day attitudes tend to reduce the differences between motherly and fatherly care. Janet Newman and co-workers report a detailed study of attitudes in the families of a series of 15 under-achievers with IQs of 130 and above. Psychoanalysis is making greater use of the methods of other behavioural sciences.

D. RUSSELL DAVIS.

**Psychotherapy Today.** Edited by VED VARMA. London: Constable. 1974. Pp. 341. Price £4.50 (cloth); £1.95 (paper).

This book aims to: 'discuss the whole range of psychotherapy past, present, and, as far as possible, future'. The chapters include psychotherapy with the pre-school and school-age child; the adolescent and the adult; behaviour therapy; drug therapy; group, social and day therapy; religious and educational therapy; availability of psychotherapy and training in dynamic aspects.

Several chapters are excellent, particularly those on group therapy (Skynner) and religious therapy (O'Doherty), both written with involvement and verve. There are clear accounts of the contributions to psychotherapy of Jung (Champernowne), Adler (Orgler) and Melanie Klein (Hughes). Educational

theory (Caspari) is interestingly linked with psychotherapy—a task that awaits physiotherapy, occupational therapy and speech therapy.

The remainder of the book, however, is verbose and uninspired; the ratio of facts to words infinitesimal. It is disappointing that there is no contribution to child psychotherapy from the Anna Freud group, one of the few teams of psychoanalysts involved in rigorous research. Other significant developments either omitted or inadequately dealt with are marital therapy, encounter therapy, personal construct therapy, existential therapy, counselling, and sexual therapy. An incomprehensible chapter by Edward Glover is included, a sad memorial to a great teacher and usually a trenchant writer. The chapter entitled Short-Term Therapy—presumably brief psychotherapy—shows little understanding of the aims and methods of this technique and how it differs from counselling. This is a pity, because the method is of major importance. The chapter on drug therapy is pointless, as it fails to make clear how and when drugs can be combined with psychotherapy. The account of behaviour therapy is dated and pedestrian.

This last criticism applies to the book as a whole. No one, least of all the unsophisticated reader to whom the book is presumably addressed, would suspect the amount of critical thinking and of research that has been done, particularly in the U.S.A., on the basic problems of psychotherapy: selection of patients, the process of psychotherapy and the outcome.

SIDNEY CROWN.

### ETHOLOGY

**Ethology and Psychiatry.** Edited by NORMAN WHITE. Toronto and London: University of Toronto Press. 1974. Pp. xi+256. Index 8 pp. Illustrated. Paperback price £1.90.

The title of this book is totally misleading. The book contains a collection of papers given at a conference on 'The Application of Ethology to Human Growth and Development'. Many of these papers are by distinguished authorities in ethology or anthropology, but only one, that by Lehrman, seriously considers the relations between ethology and psychiatry, and very few treat at any length of the application of studies on animals to the understanding of man.

Instead, most of the contributors do what they were asked to do when invited to the original conference, that is describe the studies they have been doing. Both Hinde and Kaufman give accounts of their work on the effects on infant monkeys of separation from the mother, and Harlow reviews his work on the effects of social isolation on monkeys. Crook describes the social organization and develop-

ment of primates in the wild, Hamburg discusses aggression in baboons and chimpanzees, and DeVore and Konner describe the child-rearing practices among hunter-gatherers of the Kalahari desert. All these, and some of the other contributors, provide useful short accounts of important and interesting work in ethology, and particularly in primate ethology, although almost all the work is published in full elsewhere. The collection will be of great value to those psychiatrists who would like to know more of studies in ethology.

But they will be disappointed if they expect to learn much of value for psychiatry. Several authors throw ritual mud at the three-headed monster of Lorenz-Ardrey-Morris, but only Lehrman, Hinde and Hamburg say much about psychiatry. Indeed it is evident that the majority of contributors know nothing about psychiatry, since their remarks are confined to a few passing references to psychoanalysis. Obviously that someone should make a serious attempt to provide a serious alternative to popular accounts of the relevance of ethology to man and to his problems. It is therefore all the more sad that the title may mislead people into thinking that the attempt was made here, when it was not even the aim of the original conference that it should be. Psychiatrists should nonetheless not be deterred from reading this book for the many fine scientific contributions it contains.

R. E. PASSINGHAM.

### EPIDEMIOLOGY

**Mental Disorder and Sexuality in the Climacteric.** By TORE HALLSTROM. Göteborg: Scandinavian University Books. 1973. Pp. ix+158. No price stated.

This paperback is one of a series of reports from the Psychiatric Research Centre of the University of Göteborg. It presents the psychiatric findings of a major study into medical aspects of the climacteric. It is typical of the well-planned epidemiological studies for which Scandinavian countries are noted. After a pilot study on 57 subjects a full-scale study was carried out on all women of the particular population, six months after they had reached the age of 38, 46, 50 and 54 years respectively. A population of 899 women were selected; of these 99 failed to attend. A careful study of this fall-out group demonstrated that it differed from the investigated population in that there were more single women and widows and fewer in employment. The group was subjected to an intensive series of investigations, including detailed physical and psychiatric examination, blood chemistry, ECG, peak flow spirometry, gynaecological examination, and, for the younger

patients, sternal marrow puncture and Fe59 resorption test.

The psychiatric examination consisted of a one- to two-hour interview, using a questionnaire administered by the psychiatrist, with fixed questions and restricted alternative answers. There was also opportunity for some free comment and for observations on behaviour.

The results are presented in an obsessively complete manner and are not therefore conducive to light reading. One must wonder whether this rather heavy-handed approach would be able to elicit minor degrees of mental ill health; there is also the possibility that what is being measured is the capacity to withstand the effects of a heroic series of physical investigations on the state of emotional well-being. The findings suggest that there is no relationship between the climacteric and different forms of mental illness. The book can be commended as a model for thorough obsessional epidemiological work and as a warning that its very detail may distort the findings.

C. P. SEAGER.

## INDUSTRIAL HEALTH

**Industrial Mental Health and Employee Counselling.** Edited by R. L. NOLAND. New York: Behavioral Publications. 1973. Pp. 432. Price \$16.95.

Dr. Noland has collected 34 contributions from people with different experiences, and different professions. His aim is presumably to encourage the spread of counselling by descriptions of its value in many areas. The reader may therefore be puzzled by the first chapter by Mr. McMurry, which seems at first sight to be a collection of dogmatic assertions and leaves the impressions that counselling does more harm than good (unless done by experts—who are not available); that the better intentioned the counsellor, the greater the damage; that neurotics and eccentrics are better kept out of industry, but that if they are there there is nothing to be done for them, except more and more tranquillizers; and that it is in any case not the responsibility of employers to treat them. All this is further confused by his rather unusual use of terms, e.g. psychotic reactions consist of fight, neurotic of fright; Mr. McMurry claims too, that executives prefer weak subordinates who desperately need security and structure; and it is probable that his own experience has confirmed this—he is President of his company.

The reader may be tempted to dismiss all this as a hotch-potch of old fashioned ideas but that would be wrong. It is clearly a piece of subtle editing by Dr.

Noland, meant to provide 'Aunt Sallys' to be knocked down, one by one, and the next chapters do just this. They are provided by experts who refute Mr. McMurry's statements in detail.

Dr. Kutash vividly describes cases to show what can be done by an understanding of the total personality. The four authors of the next chapter emphasize the significance of employers' prejudice against mental illness and warn the recovered patient against following the current advice 'to discuss their mental illness frankly'. This may be why, as Dr. Rosen and her colleagues next point out, non-psychiatric physicians fail to recognize many emotional problems; but even so they believe they do some good when they provide supportive therapy for those they do detect. A systematic assessment of the cost of mental illness made by Dr. Conley and others from the N.I.M.H. amounts to 20 billion U.S. dollars a year. (Mr. McMurry's figure was 6 billion.)

Mr. McLean provides an excellent review of the steady development of the occupational mental health services, made possible by the interest of many disciplines. Dr. Levinson describes three counselling programmes in detail; and Dr. Gordon makes the significant point that the psychiatrist's chief function is to support management who, in rehabilitating sick employees, take the unpopular but successful action of requiring a normal performance from them. Other views of the industrial psychiatrist's and counsellor's work are given by several writers but their accounts are disappointingly short, even Dr. Menninger having been allotted only eight pages, and this section carries little weight. However, a longer chapter here is provided by Mr. McMurry who describes very vividly the 'executive neurosis', and, contradicting his earlier assertion, agrees that much can be done by periodic informal counselling, as well as by more attention to placement and promotion.

Mr. Cohen's earlier suggestion that the community, as well as industry, has a responsibility is supported by accounts of co-operation between labour, management and the community, including insurance schemes.

The reader certainly is left with an idea of the size and cost of occupational mental illness, and of what is being successfully done in many areas in America by counselling in preventing and treating it. Dr. Noland is to be congratulated on achieving this and on his arrangement of his material. Perhaps he would have been even more effective if he had cut down the number of his contributors, avoided overlapping, and allowed more scope to those among them whose experience and judgement have given them worldwide reputations.

R. F. TREDGOLD.



**RESEARCH METHODS**

**Statistics for the Social Sciences.** By WILLIAM L. HAYS. London: Holt, Rinehart and Winston. 1974. Pp. xxi+947. Index 7 pp. Price £4.50.

This is a revised edition of *Statistics for Psychologists*, first published in 1963, but now under a slightly altered title to indicate that the book is appropriate for social scientists in general. In its short life it has established itself as one of the leading books in its field, and reviews of it have deservedly been complimentary. A mathematical statistician would describe it as an elementary textbook, but it will not appear elementary to the non-specialist, and only readers with some flair for mathematics will appreciate its true merit.

With nearly 1,000 pages at his disposal the author is able to give a detailed and exhaustive account of the more elementary statistical techniques. The emphasis is on the understanding of these rather than on computational procedures, and close attention is paid to the probability distributions commonly used for tests of significance. A special feature of the new edition is a chapter entitled 'Some Elementary Bayesian Methods', but it is intentionally put at the end to suggest that the classic procedures should first be studied and understood.

A. E. MAXWELL.

**Clinical Research for All.** By CYRIL MAXWELL. London: Cambridge Medical Publications. 1973. Pp. 166. Index. Price £2.85.

**Lectures on the Methodology of Clinical Research.** By MAX HAMILTON. London: Livingstone. 1974. 2nd edition. Pp. 197. Index. Price £5.

In the foreword to Maxwell's book, Professor Linford Rees commends this volume of 'useful advice to the beginner in clinical research'. It is written with admirable clarity, and includes chapters on the design of research, therapeutic manipulation, and data analysis. The reader is told how to calculate Chi-square but more advanced techniques of analysis are only briefly described. This book would, in the reviewer's opinion, be more useful for medical undergraduates and general practitioners than for psychiatrists, who will already have many of the skills with Dr. Maxwell wishes to impart.

Hamilton's book is written with equal clarity but takes the reader considerably further towards the complex task of the design and analysis of research. Extremely good chapters are included on analysis of variance, ranking methods, prediction and methods of association, and a variety of tests of statistical significance. For readers of this *Journal* it could well be a valuable handbook. The only drawback is the

book's price: £5 for 197 pages will probably put the volume out of reach of most budding research workers.

CHRISTOPHER BAGLEY.

**ORGANIZATION OF SERVICES**

**Psychiatry in a General Hospital.** By J. CRAWFORD LITTLE. London: Butterworths. Pp. xi+104. Price £2.00.

1,050 consecutive patients of one clinical team at the psychiatric unit of St. James's Hospital, Leeds, over a three-year period are analysed in terms of diagnosis, age, class, mode of contact and so on for 67 variables. The results are compared with other published reports and examined in the light of all available statistics and plans. It is a solid workmanlike sensible piece of work which will be valuable to all those concerned in planning psychiatric services, even though one may not agree with the assertion on the cover that the book describes 'a type of service which inevitably, despite reactionary forces, will be next adopted throughout the world'. It will provide important information for the urgent arguments as to the allocation of resources. It is perhaps a pity that this work is reported in a short but expensive paperback rather than a paper.

RICHARD MAYOU.

**The Administration of Mental Health Services.**

Edited by SAUL FELDMAN. Springfield, Illinois: Charles C. Thomas. 1973. Pp. 395. Price \$18.75.

Books of multiple authorship are often criticised for unevenness of style. This work cannot be so faulted since the thirteen authors have managed to produce uniformly turgid prose. In addition, some sections are not of direct interest to British readers, especially a chapter dealing with sources of finance, and another, oddly placed in the book, which provides a capsule account of 'The Governmental System', including even the functions of the Presidency and Congress. Yet, despite these drawbacks, the book is worth reading. Issues are raised which are relevant to the organization of psychiatric services on both sides of the Atlantic; issues especially of the roles of the administrator and of his staff of various disciplines, of authority versus egalitarianism, structure versus 'doing your own thing'. Not surprisingly, these issues are not resolved but the stimulus provided to the reader's own thoughts is sufficient to repay the effort of wading through the prose. Some of these thoughts are likely to be sombre—to reflect, for example, on the difficulty of tackling such issues in 'teams' in which the medical and social work components are administratively widely split.

DAVID ABRAHAMSON.

**The Mental Health of Rural America.** Edited by JULIUS SEGAL. U.S. Government Printing Office, Washington, D.C. 20402. 1973. Pp. xi+180. Price \$1.85 (paper).

This paperback, the work of a number of authors, edited by Dr. Segal, reflects the endeavours of the National Institute of Mental Health of America. It commences with a sombre account of the sad deficiencies in medical, psychiatric and social services for a rural people who comprise 25 per cent of the population but occupy 90 per cent of the land.

The cult of individualism mingled with that of greed, characteristics distinctly American, produce an uneasiness in an affluent society which can watch Africans on colour TV dying of starvation, yet can reject 13 per cent of its own people living below the poverty line. The report goes on to cover the psychiatric aspects of rural life to include all races—Mexican-Americans, Indians, Alaskans, Eskimos and Aleuts. The statistics reveal the favourable results of intensive drives in modern therapeutic and rehabilitation programmes.

Although not a world-shaking document, this survey is most interesting and can be wholeheartedly recommended to some of our more costive lay administrators in the British psychiatric service.

H. C. BEEGLE.

#### MISCELLANEOUS

**Contemporary Issues in Psychiatry.** By JOHN G. HOWELLS. London: Butterworth. Pp. xii+259. Index 11 pp. Price £4.00.

This book brings together eight reports published by the Society of Clinical Psychiatrists in the last four years, with claims that they represent 'progressive opinion by senior psychiatrists'. The original booklets will be familiar to many in this country, but presumably the book is aimed at a wider audience. They will find it expensive and of uneven quality, but with several valuable reviews, notably the two on design and architecture.

RICHARD MAYOU.

**Remember Maria.** By JOHN G. HOWELLS. London: Butterworth. Pp. ix+117. Price 55p.

Dr. Howells prefaces this book with a statement that he has put aside a book he is writing for the expert 'in favour of an address to those who often seem to understand better, the informed public'. What he has produced is unashamedly personal and dogmatic, more polemic than argument. He uses the mistakes and misunderstandings which led to Maria Colwell's battering by her stepfather and to her death in order to review our past overemphasis in child care on the tie with the natural mother. Whilst the book is idiosyncratic, it covers fundamental issues incisively and humanely and will no doubt be valuable to lay readers.

RICHARD MAYOU.

**Key to Psychiatry. Textbook for Students.** By MAURICE J. SAINSBURY. Sydney: Harvey Miller & Medcalf. 1974. Pp. 373. Price £3.85.

It has long been established that specialists in Commonwealth countries turn elsewhere for their training, research and textbooks. Unfortunately this practice has led to permanent emigration and so to loss of precious resources. It is to be hoped that the time is approaching when the exchange will be made more equal and fortunately there is now an increasing publication of research and of textbooks in these countries.

The present work can be recommended as a clear textbook for undergraduate students working for qualifications in several disciplines—nursing, social work, psychology or remedial therapy as well as medicine. Criticisms are minor and relate to a somewhat too classical style, for instance there are chapters on the Psychoses, Neuroses and Personality Disorders with little recognition that the distinction is less clear in clinical practice. The orientation reveals psycho-analytic theory but a reluctance to translate this in to community psychiatry.

CAIRNS AITKEN.

## Books Received

### PSYCHIATRY, PSYCHOANALYSIS AND PSYCHOLOGY

- Measurement and Classification of Psychiatric Symptoms—An Introduction Manual for PSE and Catego Program.** By J. K. WING, J. E. COOPER and N. SARTORIUS. *Cambridge University Press*. Price £4.70.
- Present State Examination—9th Edition of Interview Schedule, May 1973, reprinted from the above.** By J. K. WING, J. E. COOPER and N. SARTORIUS. *Cambridge University Press*. Price £6.00 for 20 (in paper covers).
- Psychological Aspects of a First Pregnancy, and Early Post-Natal Adaption.** By P. M. SHERSHKEFSKY and L. J. YARROW. *Elsevier- Excerpta Medica- North-Holland*. Price \$14.60.
- Cluster Analysis.** By B. EVERITT. *Heinemann Educational Books*. Price £2.75.
- The Miracle of Shock Treatment—All about modern shock treatment—how it is used, the wonders it works—a book for the layman and professional alike.** By R. E. PECK. *Exposition Press Inc.* Price \$4.50.
- Long Long—Transcultural Psychiatry in Papua and New Guinea.** By B. G. BURTON BRADLEY. *Public Health Department, Port Moresby*. Price £5.00.
- Heart Rate Variability Binary Choice Capacity in Psychiatry.** By R. E. OFFERHAUS. Research Report January 1974. 'St. Bavo' Psychiatric Centre. No price stated.
- Buddhist and Freudian Psychology.** By M. W. PADMASIRI DE SILVA. *Lakshmi Investments Ltd.* Price £2.40; £1.60 (paperback).
- Psychoanalytic Schools from the Beginning to the Present.** By D. WYSS. *Jason Aronson*. Price \$15.00.

### CHILDREN AND ADOLESCENTS

- Bernard—Bringing up our Mongol Son.** By JOHN and EILEEN WILKS. *Routledge and Kegan Paul*. Price £3.00; £1.50. (paperback)
- Adolescence, Psychology, Psychopathology and Psychotherapy.** By D. MILLER. *Jason Aronson*. Price \$15.00.
- A 'Bill of Rights' for Children.** By H. H. FOSTER. *Charles C. Thomas*. Price \$7.50; \$4.95 (paperback).

### SEXOLOGY

- The Joy of Sex.** Edited by ALEX COMFORT. *Quartet Books*. Price £6.50.

### BEHAVIOUR

- Retreat from Sanity—the Structure of Emerging Psychosis.** By M. B. BOWERS JR. *Human Sciences Press*. Price \$9.95.

### DRUG THERAPY, DRUGS AND ALCOHOLISM

- Benzodiazepines in Clinical Practice.** By D. J. GREENBLATT and R. I. SHADER. *Elsevier- Excerpta Medica- North-Holland*. Price \$16.90.
- Modern Problems of Pharmacopsychiatry—Traxodone—Proceedings of the First International Symposium, Montreal, 1973.** By TH. A. BAN and B. SILVESTRENI. *S. Karger*. Price £10.90.
- Federal and State Laws pertaining to Methadone.** By J. C. COBB, R. W. GADDIS, H. D. GOUIN and C. EPPS. *National Institute on Drug Abuse*. No price stated.
- Phenothiazines and Structurally Related Drugs.** Edited by I. S. FORREST, C. J. CARR and E. USGIN. *Elsevier- Excerpta Medica- North-Holland*. Price \$40.80.
- Alcoholism: A Medical Profile—Proceedings of the First International Medical Conference on Alcoholism; London 10–14 September 1973.** Edited by N. KESSEL, A. HAWKER and H. CHALKE. *B. Edsall*. No price stated.

### COMMUNITY, SOCIAL AND ALLIED MATTERS

- Community Mental Health—A Study of Services and Clients.** By D. H. MILLER. *Lexington Books*. Price £6.85.
- Contemporary Attitudes toward Mental Illness.** By C. M. CROCKETT, H. R. SPIRO and I. SIASSI. *University of Pittsburgh Press*. Price \$8.95.
- Is Marriage Necessary?** By L. CASLER. *Human Sciences Press*. Price \$8.95.
- The Practice of Clinical Casework.** By G. SACKHEIM. *Behavioral Publications*. No price stated.
- Roots of Evaluation—the Epidemiological Basis for Planning Psychiatric Services—Proceedings of the International Symposium held at Mannheim 26–29 July 1972.** Edited by J. K. WING and H. HÄFNER. *Oxford University Press*. Price £8.50.
- Obedience to Authority.** By S. MILGRAM. *Associated Book Publishers*. Price £2.50.
- Mental Health Program Reports—6.** By A. A. GATTOZZI, G. LUCE, C. WITTENBERG and H. YAHRAES. *National Institute of Mental Health*. Price \$2.25.
- Loneliness, the Experience of Emotional and Social Isolation.** By R. S. WEISS. *M.I.T. Press*. Price £4.50.

### MISCELLANEOUS

- Medical Book Guide.** Edited by G. L. SWANSON. Monthly Publication. Price \$145.00 p.a.
- Human Memory: Theory and Data.** By B. B. MURDOCK JR. *John Wiley*. Price £6.85.
- Home from the War.** By R. J. LIFTON. *Simon and Schuster*. Price \$3.95.
- Keats and Embarrassment.** By C. RICKS. *Oxford University Press*. Price £3.75.

Many of these books will be reviewed at a later date.

## Correspondence

Letters for publication in the Correspondence columns should be addressed to:  
The Editor, British Journal of Psychiatry, Chandos House, 2 Queen Anne Street, London, W1M 9LE

### CIRCADIAN RHYTHMS AND MANIC-DEPRESSION

DEAR SIR,

I recently suggested (Skutsch, 1973) that manic-depression might be caused by the large, *irregular* temperature changes of spring and autumn. Later it occurred to me that such changes might cause temporary disturbances in the circadian rhythms of normal persons, and I decided to monitor my own physiological rhythms for one year.

While so engaged a 'lucky' accident occurred. I had an acute virus attack which resulted in (mild) depression. The symptoms were: almost total loss of the sense of taste; poor appetite; fatiguability and anhedonia. I was thus able to note the effect of this on the aforesaid rhythms.

The first was a diurnal temperature change. Over the three months prior to the attack (Dec.-Mar.) my temperature swung between 97° and 99°F daily. During the week of the fever it never dropped to normal at all. When it finally did so (at the onset of depression) there was a new rhythm with a smaller amplitude and a higher mean; also the shape of the curve was different (see Fig. 1). This lasted for ten days, corresponding almost exactly to the depressive symptoms. The amplitude corrected itself gradually over three weeks, but the wave-like curve did not return for six.

I also measured overnight urine volumes, because it is possible that prolactin may be involved in manic-depression (Horrobin, 1974). Prolactin is anti-diuretic (Buckman and Peake, 1973) and *may* liberate anti-diuretic hormone (Manku, 1972). Its blood level is high during sleep (Nokin, 1972)—when urine volume is low—and I thought the two might vary inversely.

For three months before the virus attack the mean overnight urine volume was 515 ml. (mean deviation  $\pm 120$ ). During the fever it dropped to 200-300 ml., due, no doubt, to sweating. But when the temperature returned to normal the urine volume remained low and on the third night dropped to 142 ml. The next day my mood began to improve; that night the volume was 446 ml. The values for the

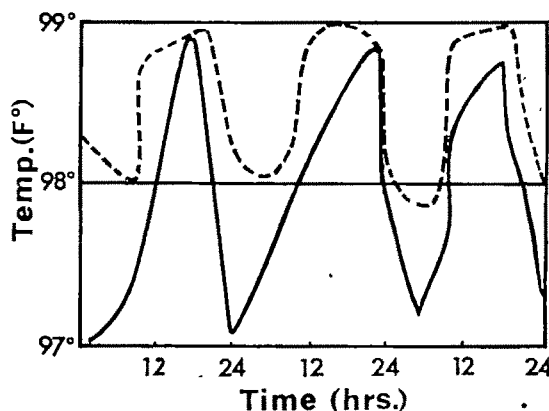


FIG. 1—  
—— normal curve.  
- - - depressive curve.

next seven nights, during which the depression cleared up were 875, 750, 625, 284, 994, 625 and 852 ml. These figures do suggest that depression is associated with fluid retention and that improvement in mood is accompanied by off-loading of the surplus water. As with temperature rhythm, the abnormal urine volumes continued for six weeks. The mean values for the weeks following the one shown in detail above were 590, 588, 641, 570, 571 and 494 ml. Perhaps lithium ameliorates manic-depression because it causes diuresis.

Before one could deduce that prolactin is involved in depression it would be necessary, of course, to show that overnight urine volumes are inversely correlated with overnight prolactin levels.

The disorder of taste suggests that gonadotrophins were involved in this depressive attack, because, in men at least, low pituitary gonadotrophins may be associated with anosmia (Price, 1972).

The simplest explanation for this attack would be low dopamine levels. Dopamine inhibits prolactin output (MacLeod and Lehmeyer, 1974), stimulates that of gonadotrophin (Kamberi *et al.*, 1969; 1970) and causes hypothermia (Summers, 1974). This would explain all the symptoms assuming that overnight urine volumes *are* inversely proportional to prolactin

levels, that anosmia is due to low gonadotrophins and that failure of the temperature to fall at night is due to the absence of the hypothermic influence of dopamine.

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#### GENETICS OF MANIC-DEPRESSIVE DISEASE: ICELAND REVISITED

DEAR SIR,

Winokur *et al.* (1967, 1970), in an elegant series of studies based on family history data, have proposed a genetic theory for the aetiology of the bipolar group of manic-depressive disorders. These authors have further suggested that the transmission is through an X-linked dominant gene (Winokur *et al.*, 1969). In support of this hypothesis, they cite the well-substantiated fact that manic-depressive disease is much more common in females than in males. Other family history data on manic-depressive disorders have supported a genetic theory of transmission, but not Winokur's specific X-linked dominant gene hypothesis (Perris, 1966).

While it is true that there is an increased incidence of females over males in manic-depressive disorder, this greater incidence is also seen in *all* affective disorders regardless of specific diagnosis, as Winokur himself notes (Winokur *et al.*, 1969). This is illustrated

by the figures for patients admitted with diagnoses of depressive disorders to the in-patient services of state and county mental hospitals in the United States during 1969 (Department of Health, Education and Welfare, Publication #HSM 72-9048, 1971). These H.E.W. data would suggest that the explanation for the approximately 2:1 ratio of females to males would have to be broader than Winokur's specific X-linked genetic hypothesis for bipolar depressions. There is additional evidence from an epidemiological study in Iceland (Helgason, 1964) which appears to be incompatible with an X-linked dominant hypothesis for manic-depressive illness.

Helgason's data consisted of 5,395 probands who were born in the years 1895-1897 and who were followed until 1957. Within the category of manic-depressive psychosis Helgason included patients who had had periods of elation or depression, or both, which occurred without known external precipitants. He also included as part of this group patients with the diagnosis of involutional depression. A total of 81 probands received a diagnosis of manic-depressive psychosis: of these, 51 had had depressions only 7 had had mania only, and 23 had had both mania and depression. The overall expectancy rate for manic-depressive disorder was 1.80 for males and 2.46 for females, giving a ratio which is compatible with an X-linked dominant hypothesis. Helgason was also concerned with migratory patterns and their relationship to the prevalence of mental disorders. Consequently, he divided his probands according to their place of residence (rural/urban) at the beginning (1910) and the end (1957) of the observation period. He then reanalysed his expectancy rates according to the place-of-residency variable (Table I).

The female/male ratio of the expectancy rate for developing manic-depressive disease for probands living in rural areas in 1910 was approximately 2:1 (3.77 for females, 1.88 for males). The female/male ratio of expectancy rate for probands living in urban areas in 1910, however, was approximately 2:3 (2.09 for females, 2.98 for males). A chi-square analysis (computed by the present authors) on the absolute numbers of manic-depressive females and males in rural and urban areas, allowing for differences in numbers of probands at risk in each area, is significant at the  $p < .01$  level ( $\chi^2 = 5.12$ ). Further, when the expected numbers of manic-depressive males and females were calculated for rural and urban areas, using the ratio derived from an X-linked dominant gene hypothesis (1 male:2 female at the population incidence of manic-depressive disorder), and compared with Helgason's observed number of cases in each category (rural and urban), they differed significantly ( $\chi^2 = 11.3$ ,  $p < .01$ , see Table

TABLE I  
*Expectancy rates for manic-depressive psychosis according to residence at the beginning of the observation period*

|                          |    |    |  | MALE                                                 |                 |                                                    |                 |
|--------------------------|----|----|--|------------------------------------------------------|-----------------|----------------------------------------------------|-----------------|
|                          |    |    |  | Rural<br>(adjusted population at risk*—<br>1,634·96) |                 | Urban<br>(adjusted population at risk*—<br>625·12) |                 |
|                          |    |    |  | No. of cases                                         | Expectancy rate | No. of cases                                       | Expectancy rate |
| Manic-depressive disease | .. | .. |  | 20                                                   | 1·88            | 13                                                 | 2·98            |
| Schizophrenia            | .. | .. |  | 11                                                   | 0·68            | 3                                                  | 0·72            |

|                          |    |    |  | FEMALE                                              |                 |                                                   |                 |
|--------------------------|----|----|--|-----------------------------------------------------|-----------------|---------------------------------------------------|-----------------|
|                          |    |    |  | Rural<br>(adjusted population at risk—<br>1,557·08) |                 | Urban<br>(adjusted population at risk—<br>732·84) |                 |
|                          |    |    |  | No. of cases                                        | Expectancy rate | No. of cases                                      | Expectancy rate |
| Manic-depressive disease | .. | .. |  | 38                                                  | 3·77            | 10                                                | 2·09            |
| Schizophrenia            | .. | .. |  | 13                                                  | 0·90            | 9                                                 | 1·28            |

Manic-depressive disease female to male ratio rural *vs.* urban  $\chi^2 = 5·12$ ,  $p < .01$ .

Schizophrenia female to male ratio rural *vs.* urban—N.S.

\* Adjusted population at risk has been determined by the weighting method of E. Slater (1938) as cited by Helgason; weights are differentially calculated according to age of onset and manifestation period of various disorders.

II). It is not possible, therefore, to explain Helgason's difference in sex ratio according to place of residence entirely by an X-linked dominant genetic hypothesis. While it is true that the Helgason data include both bipolar and unipolar groups of affective disorders, the preponderance of females to males is a general phenomenon of all affective disorders.

If the X-linked dominant theory cannot alone account for the increased prevalence of affective disorders in females over males, what other explanations can be given? A recent publication by an advocate of the Woman's Liberation Movement has suggested that the increased prevalence of all mental disorders in women is due to her culturally determined role (Chesler, 1972). While it is much too sweeping a generalization to conclude that all mental disturbances are culturally determined, there is considerable evidence to suggest that socio-cultural factors do play a role in the prevalence of affective disorders. Kendall (1970), for example, concluded that the incidence of depressive disorders varies as a function of the way aggressive impulses are handled by individual societies. Further support for Kendall's hypothesis comes from a study of the incidence of affective disorders in Belfast (Lyons, 1972), which showed that the incidence of manic-depressive disorders in males declined in the riot-torn part of the city.

If the sex-linked difference in the prevalence of affective disorders is in large measure due to the cultural concomitants of the 'woman's role', one would expect that as the female's role varies so also will the prevalence of manic-depressive disorders. While there is as yet no direct evidence on this point, some

TABLE II  
*Comparison of observed with expected lifetime incidence of manic-depressive disorders occurring in probands living in rural and urban areas in Iceland in 1910*

|        |    | *Observed rate of<br>m dep. disease/<br>1,000 of pop at<br>risk | Expected rate of<br>m dep. disease/<br>1,000 of pop. at<br>risk according to<br>X-linked hypothesis |
|--------|----|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| URBAN  |    |                                                                 |                                                                                                     |
| Male   | .. | 20·8                                                            | 11·46                                                                                               |
| Female | .. | 13·6                                                            | 22·92                                                                                               |
| RURAL  |    |                                                                 |                                                                                                     |
| Male   | .. | 12·2                                                            | 12·1                                                                                                |
| Female | .. | 24·1                                                            | 24·2                                                                                                |

Observed *vs.* expected values—Chi square = 11·3, d.f. = 1,  $p < .01$ .

\* Observed rate calculated from data given in Table I, provided by Helgason (personal communication, 1973).

indirect support comes from Craig and Pitts (1968), who calculated the suicide rates of male and female physicians for the years May 1965 to May 1967, and found them approximately equal (males: 38.3/100,000, females: 40.5/100,000). This finding is in striking contrast to the suicide rates in the general population, which are much higher for males than females. Suicide rates, according to Craig and Pitts, can be used to give an indication of the prevalence of affective disorders, since a constant 15 per cent of deaths of individuals with affective disorders are due to suicide. However, 25 per cent of the deaths of males in the general population with affective disorders are due to suicide, as compared with only 10 per cent of deaths of females in the general population with affective disorders. As the female physicians' suicide rate calculated by Craig and Pitts is very significantly ( $p < .00001$ ) higher than the suicide rate of the general population of white U.S. females (11.4/100,000) over the same time period, they conclude, using this rate as an index of depression, that the incidence of affective disorders in female physicians is very high, certainly much higher than the incidence of affective disorder in male physicians. An equally probable alternative hypothesis from the socio-cultural perspective can be made. That is, social role may affect not only the prevalence of depressive disorders but also the behavioural expression of this depression, e.g. suicides. Thus similar suicide rates in male and female physicians may reflect either similar prevalence rates of depressive disorders within this sub-population or similar behavioural expressions within this sub-population.

No final conclusions can be drawn until epidemiological studies of the prevalence of depressive disorders can be carried out in various cultural segments of our society where the 'woman's role' has become similar to the man's, e.g. as in occupational categories. It is, however, probably premature to settle on any specific explanation, genetic or otherwise, for the apparent sex-related differences in diagnostic sub-categories of affective disorders.

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#### ACKNOWLEDGEMENTS

The authors are most grateful to Dr. Thomas Helgason who provided us with his data. Acknowledgement is also extended to Miss Kathy Lennox of the Lafayette Clinic Computing Laboratory for her assistance in data analysis.

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#### ECONOMICS OF REHABILITATION

DEAR SIR,

Mr. Cheadle and Dr. Morgan (*Journal*, August, pp. 193-201), have made a most valuable contribution to the discussion of rehabilitation. At a time when the scrutiny of costs is becoming more and more rigorous throughout the public services it is at least equally important to examine and measure the benefits achieved. The meticulous research which is evident in this paper is an excellent example of the process of probing into the realities of health care which will be essential for the new Health Authorities in establishing their policies.

The paper is notable for its insistence upon hard facts; indeed it is most gratifying that the Department of Health and Social Security was able to be so helpful in providing information about National Insurance contributions, Sick Benefit and Unemployment Benefit. On the other hand, it was to be expected, and readily understood, that details of income tax could not be obtained. The authors, therefore, resorted to an estimate of earnings from which they calculated tax contributions.

All this is admirably done, but it is arguable that

too conservative a view has been taken of the benefits achieved. What emerges is a careful statement of the debits and credits in relation to the national exchequer, taking into account hospital and social security costs and tax, insurance and pension contributions. In the process, the earnings were discarded after calculating tax. If, however, the intention is to present the costs and benefits to the national economy, which is the term used in the paper, then it is proper to take credit for the output of the workers by way of contribution to production. It has been shown that the net direct costs are a little over £12 per patient per week, taking the cohort of 200 patients over ten years. It so happens that the notional weekly earnings, under-estimated by ignoring overtime, range during the decade from £7.74 to £12.92 for men and £6.83 to £11.50 for women. If these are accepted as a rough measure of output, then the contribution per working patient to the output of the economy goes a long way towards balancing the direct costs incurred on his or her behalf. Moreover, as the authors observe, every successful discharge carries benefits far beyond the limits of their ten year study.

The results of this research, and indeed of the work of the unique regional rehabilitation hospital at St. Wulstan's, can be placed in a wider perspective. Indications are given of various supportive measures in the community, and mention is made of Birmingham Industrial Therapy Association Ltd. This is a non-profit-making company which employs about 380 mental patients and has a record over some years of restoring workers to open employment at the rate of about two a week. This achievement, of course, owes a very great deal to the support of the Department of Employment, who second two Disablement Resettlement Officers to the factory, and also to health and local authorities. Nevertheless, the company operates on the principle that its objectives of rehabilitation are best achieved by accepting the normal commercial obligations of price, quality and service. On that basis the company accumulated funds which enabled it to add £17,000 to an interest-free loan of £53,000 made by the City of Birmingham, with repayment guaranteed by the Birmingham Regional Hospital Board, for the purpose of purchasing a factory. In other words, it is possible to claim that, within certain limitations, rehabilitation is consistent with good business performance.

The Department of Employment is now engaged in a radical review of the processes of rehabilitation, and the Department of Health and Social Security is, of course, closely concerned. The results revealed by Mr. Cheadle and Dr. Morgan in their research are an

important addition to our knowledge of the facts and a stimulus to all those people, professional and lay, who have an interest in fostering the developments which must surely emerge from the new national initiatives.

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#### EFFECTS OF HYPNOTICS ON ANXIOUS PATIENTS

DEAR SIR,

We agree in substance with many of the comments made by Dr. Betts and his colleagues about our paper (*Journal*, September 1974, p. 329), including their suggestion that the actions of drugs on performance are likely to be more complex in anxious subjects than in normals. With regard to their two criticisms about methods, we would say, firstly, that although it is obviously difficult to eliminate carry-over effects completely the design of this study was calculated to minimize them; and secondly, that the controversy about how best to analyse data of the sort we have presented is too long to be gone into in these columns; but it has been discussed fully by one of us elsewhere (Malpas, 1972). We look forward to hearing the results of their new experiments in due course.

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#### REFERENCE

MALPAS, A. M. (1972) Ph.D. Thesis. University of London.

#### A REQUEST FOR REFERENCES

DEAR SIR,

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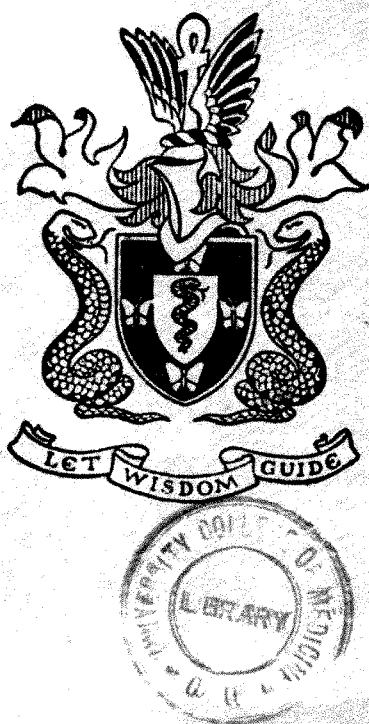


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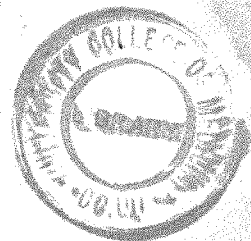
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- 1 *Modern Med.*, 17, 438, 1972
- 2 *Practitioner*, 210, 135, 1973
- 3 *Am.J.Psychiatr.*, 130, 1142, 1973
- 4 *Practitioner*, 198, 80, 1967
- 5 *J.Roy.Coll.Gen.Practit.*, 23, Suppl. 2, 33, 1973
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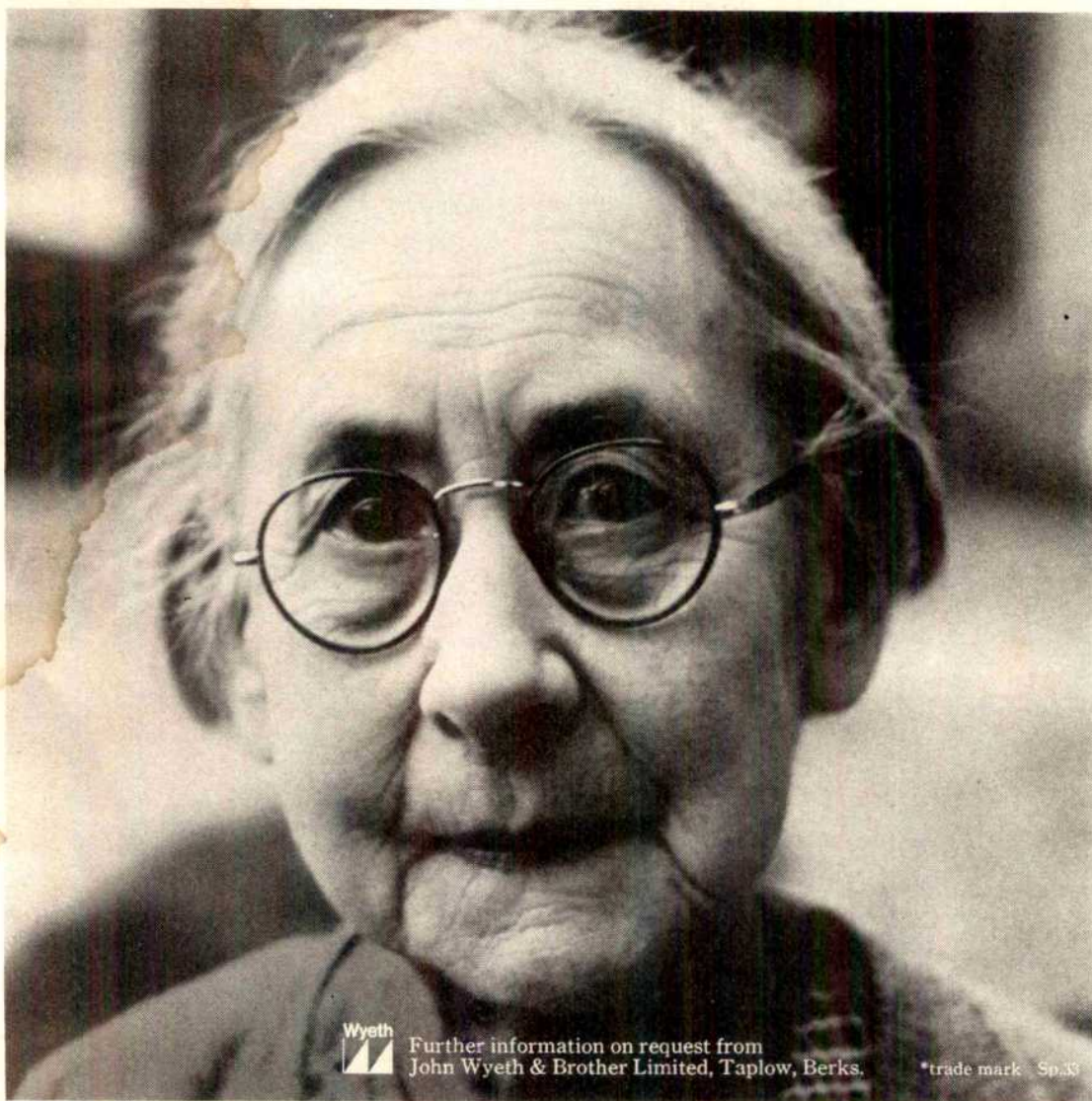
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## Battered Wives\*

By P. D. SCOTT

To achieve a successful marital partnership is probably the most difficult of life's social requirements, whether successful is defined biologically as the production of healthy offspring or in the more human terms as achieving a relationship which allows each partner to lead a satisfying life. To be successful each marital partner must often defer to the other, especially if there are dependent children present. Failure to show this capacity to defer or to be unselfish inevitably leads to conflict, and conflict can easily build up to the point of violence. The ethological study of animal reproduction, including that of primates, shows how universally true this is and what a wealth of convention and ritual is developed to reduce such dangerous confrontation.

Rather than thinking of a cause or causes of wife battering, or even of correlates of wife battering, it is more realistic to assume that marital conflict is always a possibility in every marriage, and that it will occur when the difference in individual needs between partners exceeds their capacity to adapt. Although physiological and psychological factors in either partner may contribute, it is clearly undesirable to assume that wife battering is a pathological condition in the husband which, by analogy with a disease, must be cured or eradicated. We do not wish to be involved in a psychiatric explanation of what may be largely a sociological phenomenon.

Unless both marital partners have been carefully taught not to express physical aggression within a domestic setting, some degree of physical assault is very likely to occur at times of special stress. This should surprise no one. What is surprising or should be surprising, in a civilized community, is that once the assault has reached dangerous proportions the usual self-adjusting mechanism has not come into operation to prevent repetition.

It seems, then, that wife battering is best regarded as a failure of adaptation—which means a failure to acquire the necessary social lessons whether on account of an incapacity to learn, a lack of teaching, or a temporary or permanent destruction of lessons by internal or external factors.

This brings battering into line with other social deviance. Just as crime and delinquency express conflict between the needs of the individual and of society, both or either of which may be at fault, so when a wife is battered both partners and their setting must be examined.

The similarities between wife battering and other forms of deviant behaviour are in fact striking. For example, any classification of crime or deviant behaviour will equally well fit wife battering, and the same major groups will be apparent, e.g. a small 'malignant' hard core which will be difficult to influence, and a large majority of cases which will be easily deterred or readjusted; husbands whose battering is almost the social norm over long periods of time, and husbands who only, as it were, 'go on a bender' once in a while, perhaps in response to some primary mental upset or exceptional constellation of circumstances. Again, like crime in general, and especially juvenile delinquency, wife battering in fact tends to occur alongside a constellation of other social inadequacies or failures of adaptation rather than to exist in isolation. It is not surprising, therefore, that the majority of cases are found in social classes 4 and 5, amidst poor housing conditions, rent arrears, abuse of alcohol, irregular marital arrangements, failure to use the educational and social services adequately, whereas a few, perhaps of a

\* This paper is an abbreviated version of a report compiled by a committee of the Royal College of Psychiatrists whose members are listed at the end. The contribution of each member is gratefully acknowledged.



different variety, are known to be independent of social circumstances.

These considerations might save some disappointment and wasted effort. Innumerable studies of crime have been remarkably unrewarding in establishing either causes or treatments. Only when deviants are first properly classified do meaningful correlations begin to appear, and so it will be in this problem. It will be essential to recognize the need for classification, and to work out the several natural histories of the condition, before recommending treatment measures other than emergency action. It is unlikely, also, that it will be always appropriate to refer every wife who has been battered to a special unit; her background may display half a dozen other problems just as pressing and just as likely to be deleterious to the children. Finally, to the same extent as with crime and delinquency, treatment is only likely to be a shoring-up exercise, leaving true prevention to effective education of the next generation, and to political changes.

*How should battered wives be defined?*

Battering is a dramatic word which has probably been borrowed from the well-known 'battered-baby syndrome', coined over ten years ago by Henry Kempe, who was then desperately trying to alert a disbelieving world to the realities of parental injuries to children. A similar call to the plight of wives who are repeatedly assaulted by their husbands has recently been made, and dramatic terms may be equally justified. The term may have its dangers, particularly if it is believed that there is a specific syndrome requiring stereotyped action, but the first need is to ascertain the nature and dimensions of the problem, and this will not be effected unless there is a wide awareness of it, so that the term 'battered wife' is thought to be justified and worth an attempt at definition.

'Wife' must clearly include any woman, whether a legal wife, a 'common-law' wife, or a cohabitee or *de facto* spouse, who lives together with a man. Our experience suggests that to consider only legally married women would exclude many of those whose plight is most serious. We are also informed that much, even grievous, assaulting of wives is culturally

determined, and here neither partner would welcome interference. Yet to include some phrase such as 'leading the wife to seek assistance' or 'requiring protection or help' would assume motivations in the wife which might cause error. Battering implies thoroughness or repetitiveness, in contrast to the milder and isolated blow which could scarcely constitute a marital problem. Whether repeated psychological trauma should qualify is a reasonable question, but this would include such a wide variety of cases as to require separate consideration. The seriousness of physical assault should be susceptible of grading, and its timing of categorization, for research purposes.

A battered wife is a woman who has suffered serious or repeated physical injury from the man with whom she lives.

'Serious' may be graded as:

- (1) Not requiring medical attention;
- (2) Out-patient or general practitioner attention;
- (3) Hospital admission;
- (4) Death.

'Repeated' may be categorized as:

- (1) Regular (habitual);
- (2) Episodic (situational);
- (3) Increasing (vicious circle);
- (4) Terminal.

*What is the incidence of battered wives?*

We do not know, and will have to await the necessary surveys.

The most that psychiatrists can do is to provide several pieces of the jigsaw which, though meaningless on their own, may ultimately, together with pieces from other disciplines, complete the picture. It cannot be too much stressed that being sent to, or choosing to attend, a social or medical agency probably selects a special sort of person, so that generalizations about broad social problems should never be made on the basis of clinical findings.

Nevertheless, the following figures are of considerable interest, and indicate a very large problem.

- (1) The Leeds branch of the Samaritans, on the basis of two samples, one of 10,000 clients and one of 3,500 clients, estimates that 3 per

cent of clients are battered wives, and the proportion is thought to be increasing.

(2) In Holloway Prison, Dr. d'Orban arranged for the receptions nurse, a tactful and very experienced person, to screen all admissions during a three-week period in November 1973. She asked routine questions regarding health, and during the course of the conversation enquired as to whether the prisoners had ever been physically ill-treated or beaten by her husband, boy-friend or cohabitee. Of 386 women seen, 67 (17.3 per cent) answered in the affirmative.

(3) An earlier and thorough research carried out by Professor Gibbens and Mrs. Dell surveyed 638 women, one in four admissions to Holloway Prison. Of these 350 had cohabited or been married; 60 (17 per cent) of those had a spouse described as violent. Precisely the same figure as in the study mentioned above.

(4) Dr. Gunn looked at his recent research into long-term prisoners for our purpose and writes:

'The sample consisted of 90 consecutive men taken into Wandsworth Prison at the time that Wandsworth was acting as a long-term allocation centre for the South-East Region. Each man was interviewed in some detail about his violent behaviour, because that was one of the main purposes of the study. We therefore collected a lot more information than would be on his criminal records.

Using our overall violence scale, that is rating all life events, we thought that 18 men were completely non-violent, 10 mildly violent, 37 moderately violent, 17 markedly violent, and 8 severely violent. This means, of course, that over two-thirds were rated by us as at least moderately violent. The sample contained 44 single men, 11 who were separated or divorced, and 35 who were still living with a legal or *de facto* wife. My first statistical examination of the data was therefore to see whether there was any association between marriage and violence as we had rated it, and the table shows that indeed there was.

|                | Single and<br>separated | Married,<br>etc. | Total     |
|----------------|-------------------------|------------------|-----------|
| Non-violent .. | 11 (20%)                | 17 (49%)         | 28 (31%)  |
| Violent ..     | 44 (80%)                | 18 (51%)         | 62 (69%)  |
|                | 55 (100%)               | 35 (100%)        | 90 (100%) |

$$\chi^2 = 8.12 (1 \text{ d.f.}); P = 0.005$$

Half the married men were no more than mildly violent, while 80 per cent of the single or separated men were at least moderately violent. This is a highly significant result.

I next counted the number of men on whom we had obtained a history of violence towards a wife. There were 27 who had been married at some time and rated by us as at least moderately violent. Among these we obtained a clear history in seven cases of their having at some stage attacked their wives. This, of course, must be regarded as a minimal estimate, as there were undoubtedly other cases in which for one reason or another we could not obtain the history even although we searched for it.'

Dr. Richard Fox has organized an epidemiological survey in a small Essex area and will be reporting upon this later.

### Presentation

There are indications that women are increasingly willing to bring this problem into the open, a tendency which is likely to continue, especially if appropriate 'doors' are made available on which to knock.

Unhappily, many cases of wife-battering are still only ascertained after the battering has gone too far and has forced the case into the open, either in the hospital or in the police court. Wives go to casualty departments without disclosing the real cause of their injuries, so that, as in the case of battered babies, the doctor's threshold of suspicion should be low. The inarticulate wife frequently takes an overdose. The Samaritans report an increasing proportion of their intake in the battering category.

Sometimes the wife may be driven to mental breakdown, alcoholism, or crime (especially shoplifting), and very occasionally suddenly assaulting or killing her persecutor.

Susan Dell writes about the Holloway Prison Survey:

There were a few cases where one felt that the battering husband had driven the women to drink or delinquency (such as frauds and thefts for financial reasons). Several of the older alcoholics were said to have turned to drink initially as a means of coping with violent husbands. The most pathetic example of delinquency precipitated by a battering husband was the case of a non-deviant 24-year-old Nigerian woman, who had come out to join her husband in England three years earlier. They had never lived

together before. He drank heavily, abused her, beat her and tried to strangle her on occasion. Despairing of any hope of a reasonable life with him in England, she wrote to her father to ask if she could return to him with her baby: he cabled his assent and offered to pay the fare. Her husband, however, refused to let her have her passport, and nothing she did could extract it from him. A visit to Nigeria House to obtain a travelling document also proved ineffective. A friend told her that if she did 'something criminal' she would get deported. She went to Littlewoods, took a pair of shoes, and looked around for someone to arrest her. She was remanded in custody and subsequently fined. Her husband visited her in prison, and evidently then agreed to her returning to Nigeria.

Perhaps the most important point here is that if a voluntary body sets up a service, whether specifically for battered wives or generally for distressed persons (Samaritans), it is used.

#### *The cultural factor*

It is likely that some degree of violence between marital partners has been and is a common and probably class-linked social phenomenon. Some informants believe it is increasing, but this may be a spurious effect due to a changing attitude to violence, a greater willingness to reveal and report it, and a lower tolerance towards masculine domination. Many social factors may be involved. In some communities the wife traditionally takes complete responsibility for the family, receiving the unopened wage packet and allotting pocket money to the husband; such an arrangement if taken too far may so diminish the man's self image that he is only able to assert himself with the aid of alcohol and a degree of violence. Absence of the extended family, on the other hand, may deprive a wife and her children of their natural allies in marital conflicts and so leave them vulnerable to a husband who may himself be missing the primary social controls of a close community. Greater knowledge of contraceptive techniques may reduce anxieties and make it unnecessary for a wife to fight off a tipsy husband on a Saturday night.

A psychiatrist from Western Scotland writes: 'With regard to incidence, one's clinical impression formed over the years is that it forms a part of many marriages and no complaint is

made to any outside agency . . . the wife tolerates occasional physical aggression on her husband's part because of other assets. One could almost regard this as a means of communication between the two partners, and it is possible that the wife prefers this behaviour to indifference or neglect by her husband.'

#### *Psychopathology*

Marital partners, if they are to remain together, must necessarily identify with one another. Some individuals have difficulty in affecting this identification because they cannot trust, or even because, in the most severely damaged cases, they have scarcely established their own independent identity. If their own self image is very unfavourable, as happens when individuals are rejected or ill-treated in the formative years of life, then the partner is likely to be disapproved of in like fashion and will perforce have to share the anger felt by the spouse for him or herself. In all these cases of inadequate or unfavourable identification the love relationship in its wider sense will be dissatisfying, and the partners correspondingly frustrated. There will then be a risk that alternative and perverse objectives will be substituted.

In this sense aggressiveness may become to some extent gratifying to both partners. But these substitutes are likely to be inherently incomplete, so that a danger of escalation, in a desperate attempt to break through the frustrations, may occur with a gradual building up of aggression. Dr. Hyatt Williams writes . . . 'the two forces, namely the desire for stimulation and gratification through violence and anger, and destructive feelings due to frustration, seem to multiply one by the other, and then there can be dangerous escalation . . . If one or both partners in a marital relationship contain a constellation of violent destructiveness of the kind just outlined, there are innumerable opportunities for expressing and acting out this within the marital relationship. As in the case of the battered baby syndrome, token episodes of destruction must be taken very seriously as they tend to escalate as time goes on'.

#### *Jealousy*

'Jealousy is a notoriously dangerous passion



and constitutes a well-recognized motive for crimes of violence, particularly of an uxoricidal nature' (Shepherd, 1961). The jealous personality is difficult to differentiate from intolerance of rejection; the pathologically jealous person is always so, however attentive his wife; it is not so reactive to circumstances as simple intolerance of neglect. The jealous personality in turn is not clearly distinguished from so-called pathological jealousy and delusional jealousy which may be symptomatic of a number of psychiatric conditions ranging from toxic (including alcoholic) or organic cerebral disorders, through the functional psychoses, to neurotic and personality disorders. There is thus a continuous gradation from the (perhaps useful) situational jealousy, through various degrees of sensitivity to rejection, jealous personalities, and illnesses of various sorts having a delusional component, which can be highly dangerous. Women are also affected by this whole range of conditions, and substituting stealth for strength may be equally dangerous.

#### *Immature personality disorder*

The modern tendency towards teenage marriages very much increases the incidence of conflict and violence within the marriage.

Cases involving such actually immature young people often have a good prognosis if other factors are not too unfavourable, though, unhappily, the better adjustment is often with a second spouse.

#### *Sado-masochism*

There must be great caution in assuming that a woman is masochistic and prefers a battering husband, for many of the alternative explanations are not easily appreciated—covert threats to her or the children, inability to find alternative housing or support, isolation. But where there are no bars to escape, and the wife, especially a childless wife, persistently returns to a battering husband, then it is reasonable to look for a masochistic element; it must be remembered that the expectations of marriage in some women who are themselves from violent families may be very low, and the hope of renewed affection in an ageing or lonely woman may yet be strong.

Commonly the story is of a battered wife who had a violent father and, as they sometimes say, 'a door-mat' mother; 'I only married to get away from dad, and then he was just the same as my dad'. But these women sometimes run through a series of much older and thoroughly unsatisfactory and abusing husbands, apparently unable to attract or tolerate any other type of man.

The sadistic element in the husband is much more clearly recognizable. A truly reciprocal deviance in marital partners is extremely rare, at least in clinical practice, and theoretically would be incompatible with child rearing. A sadistic husband may frequently treat his wife and children well, but indulge his sadism with other women. Sadism is not the same as bullying nor even as callous cruelty. There should be confirmatory enjoyment of the characteristic sadistic phantasy before sadistic battering is diagnosed. Masochists like being hurt, but they like to submit voluntarily and to retain some control of the situation—they avoid punishment like the rest of us.

It is expected that future research will demonstrate that frank masochism or sadism in either marital partner is not a central feature of either baby or wife battering.

#### *Prostitution*

The following fragment gives some indication of the very great complexity of the inter-relationships between the prostitute and her man.

An African aged 36 was fined for wounding Miss X, an English girl, and a few months later he was sentenced to nine months imprisonment for living on her immoral earnings.

This man immigrated at the age of 19. At 26 he was fined for assaulting the police and causing a disturbance of the peace, and at 30 he was fined for frequenting a gaming house.

After his imprisonment for living on X's immoral earnings five other offences followed over a period of five years—three months imprisonment for possessing Indian hemp, six months for slashing a man in the face with a clasp knife, fined for occasioning actual bodily harm, imprisoned for stealing, fined for striking a man in the face with his fist.

Then at 41 we find him cohabiting with Miss X and being conditionally discharged after being charged with unlawfully wounding her (bruising her with his fists). Miss X had meanwhile acquired a number of convictions for prostitution.

At 42 he receives a three-year prison sentence for living on Miss X's immoral earnings.

At 44, on his release he marries Miss X and settles down with her and her two adolescent children but the following year he is convicted again of living on her immoral earnings and imprisoned for four years. At the age of 47 (on release from this sentence) he leaves Miss X and seeks divorce, living meanwhile with another woman. The relationship is not likely to be finished as yet.

Contrary to all expectation this man presents as small in stature, of poor intelligence, cheerful and sociably pleasant, not usually aggressive, and in no way a psychiatric patient. As far as is known the girl has never sought psychiatric help.

### *The aggressive personality*

There are dangers in attributing the battering to one or other partner. Perhaps the aggressive family relationship is a better concept than the aggressive spouse.

Sometimes naturally occurring experiments are revealing, as when a woman successively married two husbands; the first an overtly aggressive man who is immediately assumed to be the aggressor; the second a kind and un-aggressive man. Yet both husbands battered her, and a degree of 'victim-precipitation' became apparent.

### *Drug and alcohol abuse*

Abuse of drugs and alcohol is a common finding in wife-battering (more so than in baby-battering), though this is no more than an impression from clinical material. Usually it seems to be just another expression of the tensions within the relationship and not necessarily directly causative. Here again there is often a degree of victim provocation towards a man of inadequate character. Alcoholism may be a feature of the grossly psychopathic husband who is totally incapable of supporting a loving relationship with anyone, or, at the other end of the scale, of the exasperated husband who seeks relief from an intolerable wife through alcohol. Each case needs individual assessment.

The subtle, or sometimes not so subtle, interaction between spouses in this area is echoed in the related field of gambling. We asked Dr. E. Moran for his views on any possible relationship between gambling and wife beating which might have appeared from his researches.

He replied:

'Although I did not specifically ask questions concerning battering in the course of my studies on pathological gambling, on reviewing my data I was unable to find any specific instance of this. If anything, the limited observations I have on this topic would suggest that the male gambler is more likely to be the subject of violence from his spouse. The wives of pathological gamblers are not infrequently rather domineering, aggressive individuals, who when problems become more acute occasionally have shown histrionic behaviour in the course of which the gambler has been assaulted.'

Dr. Griffith Edwards, as part of his research into addiction, has developed a 'hardship scale' which is orally administered by a research worker using standardized wording. At intake, questioning relates to a period of 12 months prior to the administration. This research, of course, was not planned in relation to the battering of wives, but at one point the findings are relevant. The hardship scale questions were put to the wives of 100 consecutive male married alcoholics who were being investigated at the Addiction Research Unit of the Institute of Psychiatry. The figures are striking and support some of the assumptions made in the introduction and incidence sections of this report.

| <i>Items included in the Hardship Scale administered to wives at intake</i>                            | <i>Frequency of affirmatives at intake (N = 100)</i> |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| 1. Is he restless at night, or does he wake up with bad dreams? . . . . .                              | 74                                                   |
| 2. Does he let himself get dirty, unkempt, or smelly? . . . . .                                        | 61                                                   |
| 3. Does he fail to join in family activities? . . . . .                                                | 65                                                   |
| 4. Does he pick quarrels with you? . . . . .                                                           | 76                                                   |
| 5. Has he sometimes threatened you? . . . . .                                                          | 72                                                   |
| 6. Has he beaten you? . . . . .                                                                        | 45                                                   |
| 7. Has he ever attempted to injure you seriously, even kill you? . . . . .                             | 27                                                   |
| 8. Does he sometimes go on and on for hours rowing with you? . . . . .                                 | 57                                                   |
| 9. Does he, when he's like this, break furniture (or windows or doors or china)? . . . . .             | 49                                                   |
| 10. Is he very possessive and jealous towards you, asking questions about everyone you meet? . . . . . | 49                                                   |

### *Mental illness*

As in crime and delinquency, the majority of wife battering will almost certainly prove to have no clear correlation with mental illness

(unless a degree of personality distortion is classed as such). Yet all the varieties of mental illness may occasionally play a part. Particularly dangerous is a combination of high predisposition to violence (perhaps from having experienced a great deal of aggression in childhood) together with some additional organic or functional mental illness which upsets or reduces the individual's defences against being aggressive; the commonest examples are drug intoxications, organic brain impairment, and depressive or schizophrenic states. Other examples will be found under several of the headings in this paper (e.g. pathological jealousy).

It is not always clear whether the personality disorder, heavy drinking and marital conflict have caused the mental illness, or *vice versa*, nor what part the wife's own personality plays in the conflict. Perhaps the answers are of academic importance. Factors, whether environmental or endogenous, can react to ensure the continuance, if not the escalation, of the disturbed behaviour.

*Is there a relationship between wife battering and baby-battering?*

Dr. Selwyn Smith and his colleagues collected a sample of 125 mothers and 89 fathers who had battered their offspring. For our purpose he has reviewed those 37 mothers who reported that they had been battered by their husbands or paramours. In this 25 per cent of men he further describes separate types:

Fathers who batter: (1) wife and child; (2) wife but not child; (3) wife and accidentally injure child.

Type 1—Fathers also inflicted a wide range of injuries on their children. Many of them had repeatedly battered their wives and children and several had battered more than one child and had even killed a child.

Type 2—Fathers had repeatedly battered their wives, often quite seriously, and those wives had severely beaten their children, three of them being charged with manslaughter. The incidence of convictions for violent offences was approximately 27 per cent in both fathers of Type 1 and 2.

Dr. Smith writes: 'Although no definite conclusions should be drawn at this stage, the finding that one quarter of these fathers had

battered their wives is striking, and suggests that further studies should be undertaken to explore this association'.

In a continuation of a Brixton Prison study (Scott, 1973) 50 men charged with killing their child have now been studied. Of these men 33 were living with their wife and 17 with a 'common-law' wife at the time of the killing. There was evidence that 12 of the men had assaulted their partner, 29 had not, and in 9 there was insufficient information. The limitation of the accuracy of these figures was appreciated, but there seemed no doubt that 25 per cent at least of fatal baby-battering fathers also battered their women—the same figure as Selwyn Smith estimated.

*Do men who kill their wives, batter their children; and have they previously battered their wives?*

Forty men charged with the murder or attempted murder of their wife or cohabitee were studied for this purpose in Brixton Prison.

- 5—Definite child battering
- 12—No battering of children
- 10—Had no children
- 7—Children grown up or permanently away
- 6—Insufficient information

—  
40  
—

Dr. Scott writes: 'It would be unwise to draw firm conclusions from retrospective study of such a small sample in such a sensitive area, but at least it is clear that the two sorts of violence (to wife and to children) certainly overlap to some extent.'

The same 40 wife killers were used to determine as far as possible to what extent wife-battering goes on to killing. The men fall into three fairly clearly demarcated groups.

(1) Fourteen men admitted previous battering of their wives over a long period, or else, such batterings were proved, despite their denials.

(2) Six men who had only begun to beat their wives in an increasingly severe and frequent pattern recently, in what might be regarded as a terminal crescendo or vicious circle of beating.

(3) Twenty men who had never beaten their wives but had erupted into a single, final and fatal assault.

The material suggests important and very great differences in the personalities of these types. It is the first group which contains a high proportion of men who seem quite unable to sustain any personal relationship of any kind—sometimes they batter their wife, the children and even the dog.

Dr. d'Orban looked at the reverse of this problem by collecting the cases of women admitted to Holloway Prison charged with murder or attempted murder over the last 3½ years. 'Out of a total of 131 such cases, 31 involved a husband or cohabitee. Many of these offences were victim-precipitated and the women had a history of being battered, but there has not been time to review these cases.' The association with baby battering supported the findings of Dr. Selwyn Smith's contribution.

#### *The police protection factor*

Many marital quarrels are controlled by threats of calling the police, or by actual complaint to the police (unhappily sometimes sending the oldest child to fetch them). It seems, however, that once the conflict has acquired sufficient momentum nothing will stop it, even occasionally the presence of a stranger actually trying to stop the violence, or even if the police had been present a few minutes earlier and had confiscated a weapon. The police may be most effective in the milder cases in which there is little real risk. Some individuals may only be further enraged by the presence of the police, who may themselves be attacked.

#### SUMMARY

A battered wife is a woman who has suffered serious or repeated physical injury from the man with whom she lives. The intensity and extensity of the battering can be graded.

The incidence is not yet known, but there are indications that it is large.

Battered wives, or at least many varieties of them, make use of help when it is available.

The condition is not a clinical entity but rather one possible resultant of a variety of social, psychological and psychiatric factors. It is best regarded as a failure in adaptation rather than as a disease entity, or as a failure to acquire adequate social learning (no lessons, wrong

lessons, incapacity to learn, lessons destroyed). The problem has close resemblances to other social deviance with which it often co-exists.

Classification of this diverse condition is essential, and most of the classifications of deviant behaviour and criminality can be applied.

Among the wide variety of arbitrary types of wife battering which are described in psychiatric practice, and apart from the probably major cultural type, are the immature personalities (which may have a good prognosis); the other personality disorders, notably the dependent and aggressive types; the jealousy reactions, ranging from intolerance of competition to delusional jealousy (which are so dangerous as to demand separation of the spouses); the addictions, which probably more often co-exist with battering rather than cause it, but sometimes offer a convenient focus for treatment; practically all the psychiatric illnesses, though none is essential. The frequently observed return of a battering couple to one another suggests sado-masochism, but this is probably less common than is supposed—other conditions simulate it, especially dependency, fear of loneliness, and not knowing that there is any better form of relationship. The hardship scale developed by Dr. Griffith Edwards and his team provides a useful approach to this field, which may have advantages over the more limited concept of battering.

Especially in psychiatric practice (which no doubt concentrates the pathological varieties of the condition) it is common to find battering families rather than a battering father—the father may assault the children as well, and may receive a great deal of aggression himself; the battered mother is quite likely to be a battering mother.

Studies of small samples of child-battering fathers suggest that at least one quarter of them also batter their wives.

Battering of wives certainly leads on in some cases to killing the wife.

Police protection, like all other demonstrations of power, is most effective in contemplation. It is unreasonable to expect police to protect the wife from a psychiatrically ill husband, or from one in an advanced state of

passion, in a domestic situation, and in fact they cannot.

#### *Practical measures*

A great deal more needs to be known about this problem. The greatest need is for sociological and epidemiological data, to indicate the size of the problem and the attitudes of those involved to available help. The only way to establish normative data will be a properly conducted house to house survey.

There is still room for descriptive research, especially if it can indicate to social workers the several natural histories of the condition and thus encourage a habit of enquiry and treatment flexibility rather than application of stereotyped approaches.

In psychiatric practice particularly, there is seldom any doubt as to where to start with treatment, for the constellation of problems both sociological and psychological is so great; but this may not be so in the more culturally determined cases.

Because of the variety of factors involved it will be essential to promote a close liaison between competent agencies—the police (who should be able to call in a social worker when they can do no more), the minister of religion, the children's officer where children are at risk, the general practitioner, probation officer, psychiatric team, housing authority and voluntary agencies. The solicitor and magistrates' clerk are key persons when an injunction to

restrain a husband is required; such an injunction can be issued within a day, but it rarely is.

To promote this liaison, a centrally placed and well advertised co-ordinating centre should be organized, with a 24-hour advisory service.

Short-term accommodation for wives and children following the pioneering pattern of the Chiswick project seems essential to cope with emergencies, to allow passions to simmer down (if that is possible), and to permit time for a sensible long-term plan to be made, and for supervision to be arranged.

A continuing programme of local and national education is clearly a necessity, not least in schools for the next generation of parents.

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## Femininity and Preferred Partner Age in Homosexual and Heterosexual Males

By KURT FREUND, RON LANGEVIN, RICHARD LAWS and MICHAEL SERBER

### INTRODUCTION

Ferenczi (1927, orig. 1911) thought that on clinical grounds he had clearly established two types of homosexual<sup>1</sup> males. One type combined masculinity and a preference for pubescents, and the other type combined femininity with a preference for physically mature partners. However, Hirschfeld (1920, p. 267, 277, orig. 1914), who had examined a very large number of homosexual males, doubted the existence of any relationship between femininity and age preference.

In an earlier study (Freund, 1960) which tested Ferenczi's clinical impressions, androphilic<sup>2</sup> males appeared to be more 'feminine' than ephebophilic<sup>3</sup> or homosexual paedophilic<sup>4</sup> males, offering some support for this hypothesis. In the study, subjects were compared on individual items which experienced clinicians (Krafft-Ebing, 1890, orig. 1886; Hirschfeld, 1920, orig. 1914) have considered to be indicative of 'femininity' in homosexual males, e.g. whether as a child the subject had preferred to play with boys or girls, whether he had preferred boys' or girls' games, toys etc. Most of the items differentiated between homosexual and heterosexual males as well as between androphilic and non-androphilic homosexual males (Freund and Pinkava, 1960; Freund, 1960). However, in the homo-heterosexual comparisons only heterosexual males who preferred physically mature females were included, and the varying age preference among the homosexual males was ignored, thus confounding preferred partner

sex with preferred partner age. Both age preference and sex preference appeared to be related to 'femininity', but it remained uncertain what the contribution of each was.

The task of the present study was to replicate and complete the earlier investigation by employing scales, and to arrive at estimates of (1) the relative difference in femininity between heterosexual and homosexual males, and (2) the strength of the relationship between femininity and preferred age of partner. Three homosexual groups, comprised of androphilic, ephebophilic and paedophilic subjects, and two heterosexual groups, of normal and paedophilic subjects, were employed. The main instrument was the 'feminine gender identity' scale—hereafter FGI scale (Freund *et al.*, 1974b)—which is composed of clinical items of the kind mentioned earlier. For the comparison between homosexual males with varying preferred partner age, the femininity scale of the Personal Values Abstract from Gough's California Personality Inventory (1970) was used as well. In comparing homosexual and heterosexual males, however, only the FGI scale was employed. As a third instrument, the phallometric test (Freund, 1957; Freund *et al.*, 1965) was used to validate a particular part of the FGI scale which had differentiated best between androphilic, ephebophilic and paedophilic groups (see Results).

The terms 'femininity' and 'feminine gender identity' are not yet very clear. Gender identity is obviously a partial aspect of the more general alternative of masculinity *vs.* femininity. The term 'gender identity' denotes a subject's chosen gender role or, more precisely, his or her gender role preference. However, the degree to which particular questionnaire or clinical items represent feminine gender identity *vs.* another kind of femininity is still unknown.

<sup>1</sup> Homosexuality is the sustained erotic preference for same-sexed persons when there is a free choice of partner as to sex and other attributes which may codetermine erotic attractiveness.

<sup>2</sup> Erotic preference for physically mature males.

<sup>3</sup> Erotic preference for pubescent males.

<sup>4</sup> Erotic preference for children.



## METHOD

*Subjects*

There were 260 paid androphilic volunteers from homosexuals' clubs,<sup>5</sup> and 32 ephebophilic and 24 homosexual paedophilic, in the majority paid, volunteers from two prison hospitals. The ephebophilic subjects were selected on the basis of three criteria: at least one charge of having interacted sexually with a boy 12 to 16 years of age, plus the subject's own admission of this age preference and no charge pertaining to sexual interaction with children under 11 years. The homosexual paedophilic group consisted of males who had been charged at least once with having interacted sexually with a boy under 12 and not with older boys, and who admitted an erotic preference for male children.

There was a normal heterosexual control group of 30 subjects and a heterosexual paedophilic group of 25 subjects. For the group of heterosexual normals, 10 subjects were randomly selected from each of three larger heterosexual groups used in the study of Freund *et al.* (1974b). The heterosexual paedophilic group was selected according to a criterion analogous to that from the homosexual paedophilic group. The mean age, age range and education for each group of subjects is given in the Table. There were significant differences between groups in age ( $F = 3.38$ , d.f. = 4; 133,  $P < .005$ ) and education ( $F = 12.13$ , d.f. = 4; 133,  $P < .001$ ). Instead of the total sample of androphilic males, a subsample of 30 subjects was used in this comparison, and analysis of variance was carried out. The results described later were unchanged when age and education

were covaried. The samples used for the various comparisons will be indicated with the respective results.

*Tests and procedures*

A sexual deviation questionnaire and the California Personality Inventory were administered. From the sexual deviation questionnaire, the FGI scale was used. This scale is composed of 19 items: twelve items are applicable to all males, and an additional seven items apply only to homosexual or transsexual males; so full FGI scores could be considered only in comparisons of the homosexual groups. From the California Personality Inventory, only the femininity scale—hereafter Gough scale—was scored.

The phallometric test of erotic preference measures responses in the form of penile volume changes to potentially erotic stimuli. The stimuli were pictures of 5 to 8-year-old boys, of 9 to 11-year-old boys, of pubescent boys, of physically mature males and of females in corresponding age brackets, all taken in the nude. Each sex-age category was represented by six slides and six short movies (see Freund *et al.*, 1973 for details of the procedure).

## RESULTS

Wherever the statistical methods employed are not expressly indicated, they were analyses of variance and the Newman-Keuls test (Winer, 1962).

*Sex preference vs. age preference*

In order to assess the relative contributions of preferred partner sex and preferred partner age, a  $2 \times 2$  analysis of variance was executed in which the ephebophilic group was omitted and

TABLE  
*Age and education*

| Groups              | Mean age | Age range | Mean education                                |
|---------------------|----------|-----------|-----------------------------------------------|
| Androphilic ..      | 27.0     | 17-34     | High school and college                       |
| Ephebophilic ..     | 32.2     | 18-54     | 12 grades completed                           |
| Hom. paedophilic .. | 26.7     | 18-47     | More than 8 grades completed but less than 12 |
| Het. norm. ..       | 30.2     | 21-49     | 12 grades completed                           |
| Het. paedophilic .. | 29.8     | 18-65     | More than 8 grades completed but less than 12 |

<sup>5</sup> However only 234 among them had a full FGI score. The remaining 26 subjects had omitted one or several items.

the earlier-mentioned androphilic subsample was used.

In this comparison the combined score of only those 12 FGI scale items was used which could be employed with heterosexual subjects as well. A least square solution was obtained for the two levels of sex preference (homosexual *vs.* heterosexual) by two levels of age preference (mature *vs.* immature partners). There was a significant effect of sex preference ( $F = 11.105$ ,  $d.f. = 1; 108$ ,  $P < .001$ ) and a significant interaction of sex by age preference ( $F = 15.253$ ,  $d.f. = 1; 108$ ,  $P < .001$ ). However, there was no significant effect for age preference ( $F = 3.274$ ,  $d.f. = 1; 108$ ,  $P < .07$ ). The normal subjects scored significantly lower than the other three groups and there were no significant differences among the latter. The relative contribution of sex preference variance was 14.2 per cent of the total variance, that for age preference was 3.2 per cent and that for sex by age preference interaction was 5.3 per cent, as determined by variance components analysis (Endler, 1966).

When the ephebophilic group is considered in a one-way analysis of variance over the five groups, the results are similar ( $F = 6.852$ ,  $d.f. = 4; 138$ ,  $P < .001$ ). There were no differences between the androphilic, the ephebophilic, the homosexual and the heterosexual paedophilic groups, and each of these groups scored more feminine than the normals.

#### *Comparison of the three homosexual groups on the full FGI scale score*

The consistency of the full FGI scale was assessed by intraclass correlations from analysis of variance (Winer, 1962) over all three groups of subjects,  $r_k = .85$ . In an earlier study, the  $\alpha$ -reliability coefficient of the FGI scale, as assessed by the Kuder-Richardson formula, was .93 (Freund *et al.*, 1974b). Thus the reliability of this scale is comparable in both studies.

In the total homosexual sample, the androphilic group had a significantly higher full FGI scale score than did the two remaining homosexual groups ( $F = 5.88$ ,  $d.f. = 2; 283$ ,  $P < .01$ ), and there was no significant difference between ephebophilic and homosexual paedophilic subjects.

This result remained unchanged when age and education were covaried out. The relative contribution of group variance (age preference) to total variance was 11.21 per cent.

The results should be treated with caution because when the earlier-mentioned subsample of 30 androphilic males was employed the results were not significant. However, when using another similar sub-sample of androphilic males there was the same significant discrimination as in the full sample. In addition, the Gough scale discriminated significantly in the same way among the three homosexual groups (see later).

The range of the FGI scale is broad enough to encompass extreme degrees of FGI, as encountered in transsexual males. It was therefore to be expected that the differentiating items should represent the lower range of the FGI scale. This expectation was tested by assessing, for each FGI item separately, whether it discriminated between the three groups, and by investigating whether the discriminating items fell within the lower range of the scale. Only those items were accepted as valid discriminators for which the  $F$ -value was significant at  $P < .01$ .

Four items (a, b, n, o) of the FGI scale met this criterion: (a) whether at an age between 6 and 12 the subject preferred to play with girls or boys or whether he had no preference in this regard; (b) whether at such an age he had preferred girls' or boys' toys and games or whether he had had no preference in this regard; (n) whether he preferred a partner whose behaviour was strongly masculine, rather feminine or rather childlike; (o) whether he preferred a partner who was willing to lead him, whether he preferred to lead the partner himself, or whether this did not make any difference. On each of these items the androphilic subjects indicated a higher degree of FGI, and on none of the 19 items of the scale did the androphilic group score significantly lower on FGI than the remaining subjects. On item (o) the non-feminine scoring subjects had a higher education than those indicating some degree of FGI ( $t$ -test,  $P < .05$ ). In this analysis the earlier-mentioned androphilic sub-



sample was used. Each of these four items was dichotomized. For the 165 androphilic subjects who scored in the lower half of the scale range, cumulative frequency curves were calculated for each of the FGI items over the attained full scale scores, and the significance of differences among these curves was assessed by Kolmogoroff-Smirnoff tests (Siegel, 1956). The cumulative frequency curves of the four discriminating items rose significantly faster than did the curves of all the remaining items, thus supporting our expectations (in each case  $P < .01$ , with the exception of the difference between item (n) and one of the non-discriminating items, which difference did not reach even the .05 significance level).

*FGI scores and age preference indicated by phallometric responses*

The FGI scores of the total group of androphilic males were distributed from 1 to 34 (minimum 0, maximum 38). The width of this range suggested an inquiry as to whether within the group of androphilic males there was also a positive correlation between femininity and preferred age of partner.<sup>6</sup> Therefore, the 67 androphilic males to whom the phallometric test had been administered and who had a full FGI score were examined. FGI scores were correlated with the differences between the subject's penile volume responses to pubescent boys and to physically mature males. These responses were expressed in terms of standard scores derived for each subject separately, from all his responses. The difference between responses to physically mature males and to pubescent boys did not correlate significantly with the full FGI score ( $r = .14$ , d.f. = 65,  $P = .139$ ). However, when the full FGI score was replaced by the combined score of only those four FGI items which discriminated between androphilic males and the remaining subjects, the correlation increased to  $r = .29$  (d.f. = 65,  $P = .009$ ).

<sup>6</sup> It was not possible to correlate phallometric responses with the Gough scale because of the small number of subjects to whom both the phallometric test and this scale had been administered together.

*Femininity on the California Personality Inventory<sup>7</sup>*

Only the three homosexual groups were compared on the Gough scale. The androphilic subjects scored higher than the remaining subjects, but there was no significant difference between ephebophilic and homosexual paedophilic subjects ( $F = 4.617$ , d.f. = 2; 55,  $P < .01$ ).

SUMMARY

The relationship between 'femininity' and male homosexuality was investigated, taking into consideration preferred partner age. Results indicate that homosexual males in general score higher on femininity than do heterosexuals, and that within the homosexual groups such males who erotically prefer physically mature partners score higher on femininity than do those who erotically prefer pubescents or children. There was the unexpected finding that heterosexual paedophilic males scored higher on femininity than normals and could not be differentiated in this respect from the homosexual groups. This finding, if confirmed, may offer a useful lead for research in heterosexual paedophilia or hebephilia (a preference for pubescent girls).

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## Personality Characteristics of Male Homosexuals Referred for Aversion Therapy: A Comparative Study

By R. K. TURNER, H. PIELMAIER, S. JAMES and A. ORWIN

Most studies on the personality of homosexuals have been based on patients or prisoners (e.g. Cattell and Morony, 1962), and much less is known about those who do not fall into these categories. This report summarizes a comparison of the personalities of a sample of normal British homosexuals with a patient group who sought treatment. It was hoped through this investigation, an offshoot study of a major treatment programme for homosexuals, to determine the relationship between personality characteristics and referral for treatment; also to obtain further information about the personalities of non-treatment-seeking homosexuals.

### METHOD

#### Subjects

(a) *Non-patients*: 59 subjects (mean age 47.2 years) were obtained through an advertisement in a Newsletter circulated to members of a sexual minorities society; the note asked for the help of volunteers to co-operate in a postal enquiry into factors related to homosexuality.

(b) *Patients*: 51 homosexuals (average age = 27.8 years) who had been appropriately assessed were taken by order of referral for treatment.

#### Procedure

(1) *Non-patients*: Personality tests and questionnaires were sent through the post; there was no personal contact. Respondents were asked to provide demographic details and to complete a brief questionnaire on heterosexual experiences, apprehension by police for sexual offences, and any previous attempts to secure professional help for their homosexuality. The controls were divided into two sub-samples:

Group 1a (N = 41) who had never sought treatment (69 per cent).

Group 1b (N = 18) who had previously done so (31 per cent).

(2) *Patients*: Similar tests were administered and details elicited as part of the assessment prior to treatment.

#### Measures used

(i) The Eysenck Personality Inventory (EPI Form A) which has been standardized on a British population (Eysenck and Eysenck, 1964).

(ii) The Sixteen Personality Factor Questionnaire (16 PF Form A, 1962) as it had been used in previous investigations (Cattell and Morony, 1962; Cattell and Eber, 1964; Evans, 1970).

### RESULTS

(1) *EPI scores*: Prior to analysis inspection of scores revealed no high lie scores, and there was no exclusion because of this. Differences between the three groups with respect to Extraversion were not found to be statistically significant ( $F = 0.9718$ ; d.f. 2, 107;  $p = > 0.10$ ); there was, however, a significant difference across the three mean Neuroticism (N) scores ( $F = 3.6582$ ; d.f. 2, 107;  $p = < 0.5, > 0.01$ ). The patient sample obtained the highest mean N score, while the smaller sample of subjects in Group 1b occupied a position intermediate between patients and Group 1a. Comparison of the three groups with standardization test norms revealed that subjects in Group 1a were significantly introverted but were within the average range on the Neuroticism dimension, while the patients were a markedly neurotic group.

(2) *16 PF scores*: All three groups obtained high scores on Factor B, intelligence, but these were considered to reflect sampling bias. Means and standard deviations on the remaining 15 factors are shown in Table I, where it can be seen that the groups differed significantly in respect of four factors, groups O, Q<sub>1</sub>, Q<sub>2</sub>, and Q<sub>4</sub>. There was a distinct gradient on each of these four factors' scores, and subjects in Group 1b occupied a position intermediate between patients and Group 1a, the patients being more apprehensive, conservative, group-dependent and tense.

As Cattell and Morony (1962) suggested that there was a characteristic homosexual personality profile, this was examined by comparing mean factor scores of control subjects in Group 1a with general population norms. In an attempt to overcome problems of interpretation when using an American personality test with British subjects, mean factor scores were compared with (1) standardization norms for the 16 PF test (i.e. mean sten scores = 5.5, s.d. = 2.0), and (2) mean scores obtained by subjects in a sample of 100 Scottish normals (McAllister, 1968).

TABLE I  
16 P.F. Sten Scores in three samples of homosexuals

| Factors                                      | Control non-patient samples |        |                    |        | Patients<br>(2)<br>N = 51 |        | F. ratios |
|----------------------------------------------|-----------------------------|--------|--------------------|--------|---------------------------|--------|-----------|
|                                              | Group 1a<br>N = 41          |        | Group 1b<br>N = 18 |        |                           |        |           |
|                                              | Mean                        | S.D.   | Mean               | S.D.   | Mean                      | S.D.   |           |
| A Reserved/outgoing .. .. .                  | 5.93                        | (2.38) | 5.28               | (2.32) | 5.86                      | (1.60) | 0.69      |
| B Less intelligent/more intelligent ..       | 8.05                        | (1.50) | 8.61               | (1.65) | 7.76                      | (1.59) | 2.46      |
| C Affected by feelings/emotionally stable    | 3.73                        | (1.78) | 3.78               | (1.93) | 3.10                      | (1.69) | 2.18      |
| E Humble/assertive .. .. .                   | 4.54                        | (1.73) | 4.89               | (2.42) | 5.35                      | (2.10) | 1.86      |
| F Sober/happy-go-lucky .. .. .               | 5.07                        | (2.48) | 4.94               | (2.07) | 5.59                      | (2.05) | 0.87      |
| G Expedient/conscientious .. .. .            | 4.05                        | (1.72) | 4.17               | (1.10) | 3.35                      | (1.66) | 2.87      |
| H Shy/venturesome .. .. .                    | 3.77                        | (1.48) | 4.00               | (1.75) | 3.92                      | (2.14) | 0.14      |
| I Tough-minded/tender-minded ..              | 7.98                        | (1.75) | 7.61               | (2.17) | 7.06                      | (1.71) | 2.80      |
| L Trusting/suspicious .. .. .                | 6.51                        | (1.96) | 6.50               | (1.69) | 6.29                      | (2.14) | 0.15      |
| M Practical/imaginative .. .. .              | 6.93                        | (1.84) | 6.78               | (1.77) | 6.33                      | (1.81) | 1.29      |
| N Forthright/shrewd .. .. .                  | 5.07                        | (2.05) | 4.33               | (1.88) | 4.16                      | (1.75) | 2.57      |
| O Self-assured/apprehensive .. .. .          | 6.37                        | (1.84) | 6.83               | (2.48) | 7.69                      | (1.78) | 5.45**    |
| Q1 Conservative/experimental .. .. .         | 6.17                        | (2.08) | 5.44               | (1.85) | 5.10                      | (2.10) | 3.12*     |
| Q2 Group-dependent/self sufficient ..        | 8.00                        | (1.75) | 7.56               | (1.65) | 6.84                      | (1.84) | 4.92**    |
| Q3 Undisciplined self-conflict/controlled .. | 4.32                        | (1.82) | 4.39               | (1.87) | 3.59                      | (1.49) | 2.64      |
| Q4 Relaxed/tense .. .. .                     | 6.07                        | (1.94) | 7.06               | (2.60) | 7.45                      | (1.79) | 5.50**    |

\*  $p < .05$ .\*\*  $p < .01$ .

Mean factor scores were counted as extreme if they were in excess of one sten score above or below both American and Scottish means. With this method of analysis, subjects in Group 1a were found to have high scores on Factors I, M, Q<sub>1</sub>, and Q<sub>2</sub>, and low scores on Factors C, G, H, and Q<sub>3</sub>. Considering only those significant results which are in accord with the earlier investigation of Evans (1970), non-treatment-seeking homosexuals may be characterized as more emotional (C), expedient (G), shy (H-), tender minded (I+), imaginative (M+), self-sufficient (Q<sub>2</sub>), and less controlled (Q<sub>3</sub>).

#### CONCLUSIONS

This study indicates that there are significant personality differences between homosexuals who are referred for treatment and those who live in society without seeking professional help. It would be useful if present results were cross-validated, since the non-patient sample was probably atypical; for example, they were members of a sexual minorities society and they were also considerably older than our patient sample. However, the implication is plain: it is inadmissible to generalize observations about homosexuals when information is based solely on patients. Moreover, cultural and environmental factors are influential in determining whether or not a homosexual decides to seek treatment, and it would be a

pity if research into referral bias were confined only to the study of personality factors. Put in the broader context of psychotherapy research, it is hoped that the present study will provide further impetus for future workers to investigate the many factors that may be significant at the stage of candidacy for treatment (Kiesler, 1971).

#### SUMMARY

Three groups of male homosexuals were compared with respect to two personality measures. Those who sought treatment for homosexuality were found to differ significantly from a sample of non-patient homosexuals who had never sought treatment. The data were interpreted as evidence in support of the hypothesis that personality characteristics are significant in candidacy for treatment.

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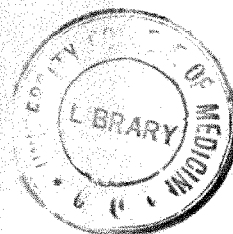
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# Psychiatric and Psychosomatic Illness in the Deaf

By S. B. MAHAPATRA

While there is general agreement that deafness, either congenital or acquired in early childhood, is psychologically damaging (Oléron, 1953; Furth, 1961; and Vernon, 1966), opinions are divided on the adverse effects that deafness beginning in adolescence or in adult life may have on mental health. For example, Furth (1966) has reported that the way of life of the adult deaf should not be all that different from people with normal hearing, although it has been generally held that deafness in adults predisposes to the development of irascibility and paranoid attitudes (Kraepelin, 1915; Slater *et al.*, 1969). The relationship between deafness and paranoid illness has been investigated by Houston *et al.* (1964) and Kay *et al.* (1961).

The present investigation was designed to study the prevalence and the nature of psychiatric and psychosomatic diseases from which patients had suffered since becoming deaf in adolescence or adult life. The purpose was to test the hypothesis that the deaf would be more liable than the control subjects to suffer from psychiatric disorders.

Eighty-nine patients between the ages of 15 and 65, consecutively admitted to the E.N.T. wards of Leeds General Infirmary for stapedectomy, were included in this study. These patients had unilateral or bilateral hearing loss of conductive type due to otosclerosis. None had suffered from hearing loss in childhood. None of them had been referred by psychiatrists and none had any history of psychiatric or psychosomatic illness before their loss of hearing. Patients suffering from systemic diseases or organic brain syndromes were excluded.

Hearing loss was measured by audiogram, and on the basis of the findings the patients were divided into two groups: the deaf with bilateral hearing loss of 40 d.b. or more for the frequency of 250 C.P.S. ( $n = 49$ ; males = 24, females = 25), and the controls with unilateral hearing loss of 40 d.b. or more from the frequency of 250 C.P.S. ( $n = 40$ ; males = 24 and females = 16). Those patients with bilateral hearing loss of 70 d.b. or more were considered to be severely deaf.

In each patient the duration of hearing loss was noted as well as whether he used a hearing aid.

(In no case was an aid found to have effectively restored normal hearing.)

Psychological and psychiatric assessments were carried out the day before the patients were operated upon. The patients completed Cornell Index Form N2, a questionnaire with 101 items designed to provide an estimate of psychiatric and psychosomatic disturbance, a score of 13 or more indicating possible presence of such disturbance (Weider *et al.*, 1948). Every patients also had a psychiatric interview with the author, who was unaware of Cornell Index Score at the time. Psychiatric diagnosis was based on the International Statistical Classification of Diseases, 8th revision (1965). Any history of psychiatric illness in the patient's family was recorded, and it was also noted whether the patient lived alone or with family or relatives. Illnesses such as migraine, asthma, peptic ulcer, ulcerative colitis, hypertension, dermatoses etc. which these patients had suffered since their hearing loss were recorded.

## RESULTS

The 49 deaf patients and the 40 control subjects were found to be comparable in respect of age, sex, living status and use of hearing aid.

### (a) Cornell Index scores

The mean Cornell Index Score of the deaf group was significantly higher ( $P < 0.001$ ) than that of the controls (Table I).

TABLE I  
Cornell Index (N2) scores of the deaf\* and controls†

| Groups              | Number of patients | Mean  | S.D.  | P      |
|---------------------|--------------------|-------|-------|--------|
| Male controls ..    | 24                 | 6.71  | 6.24  | <0.01  |
| Male deaf ..        | 24                 | 12.29 | 7.91  |        |
| Female controls ..  | 16                 | 19.56 | 5.45  | <0.05  |
| Female deaf ..      | 25                 | 17.00 | 14.06 |        |
| Total control group | 40                 | 7.85  | 6.08  | <0.001 |
| Total deaf group .. | 49                 | 14.69 | 11.52 |        |

\* With a hearing loss of 40 d.b. or more in both ears.

† With a hearing loss of 40 d.b. or more in only one ear.

It was found that the number of deaf having a Cornell Index Score of 13 or more was greater than the corresponding number of the controls ( $P < 0.005$ ).

(b) *Psychiatric illnesses*

Eleven men and 12 women in the deaf group and 3 men and 3 women in the control group were found to be suffering from psychiatric illness. This was a significant difference ( $P < 0.005$ ) in respect of the deaf. Among the 23 deaf patients with psychiatric illness, 17 had depressive illness (74 per cent), 5 had paranoid illness (22 per cent) and the remaining patient had an anxiety state. No family history of psychiatric illness was found in any of these patients. Of the 23 deaf patients with psychiatric illness 18 had a Cornell Index Score of 13 or more.

(c) *Psychosomatic illnesses*

There were 7 subjects amongst the controls with a history of psychosomatic illness while there were only 2 in the deaf group. This difference, is not significant.

(d) *Relationship between psychiatric morbidity and other factors in the deaf*

Psychiatric morbidity did not appear to correlate with duration of deafness. It was worth noting that 41 of the 49 deaf patients studied here happened to have been deaf for five or more years. Of the 10 severely deaf patients (meaning a bilateral hearing loss of 70 d.b. or more) only 2 were psychiatrically ill. On the other hand, of the 11 deaf patients living alone 8 were found to have psychiatric illness, though there was no overall significant difference. Psychiatric morbidity in the deaf did not appear to be related to the use of hearing aids.

#### DISCUSSION

The purpose of this study was to test the hypothesis that there is a positive association between deafness (onset in adolescent or adult life) and subsequent development of psychiatric disorders. The results confirm this hypothesis, but the findings agree only in part with the observations of Kraepelin (1915) and Slater *et al.* (1969), who considered paranoid attitude or even paranoid psychosis attributable to deafness in adults. Although, there has been a trend for psychia-

trically ill deaf patients to live alone, this finding did not reach a significant level to confirm the findings of Kay *et al.* (1961). This may be due to the fact that the patients reported by Kay *et al.* were aged 60 or more while the mean age of deaf patients studied here was 44.96 with a S.D. = 11.72.

#### SUMMARY

The prevalence of psychiatric and psychosomatic diseases was studied in patients who had become deaf from otosclerosis in adolescence or in adult life. Assessment of 49 deaf patients with bilateral hearing loss of 40 d.b. or more by Cornell Index N2 Questionnaire and psychiatric interview showed a significantly higher prevalence of psychiatric illness among the deaf. Among the deaf, depressive illness was found to be the predominant type of psychiatric illness. No significant difference emerged between the two groups in respect of psychosomatic illness.

#### ACKNOWLEDGEMENT

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## Overinclusive Thinking in Mania and Schizophrenia

By N. J. C. ANDREASEN and PAULINE S. POWERS

Beginning with the work of Cameron (1944), the concept of overinclusive thinking has been used to describe or account for the thought disorder observed in schizophrenic patients. This is usually defined as an inability to preserve conceptual boundaries, perhaps based on a cerebral input dysfunction which causes difficulty in filtering stimuli (Payne *et al.*, 1959; McGhie, 1970; Epstein, 1953; Broadbent, 1958). This leads the schizophrenic to make remote associations and to overgeneralize or overabstract.

Research done by Payne and his associates (1959; 1960; 1962) to evaluate the concept of overinclusiveness produced a battery of tests which seemed to differentiate schizophrenics from depressives, neurotics and normals. More recently the Payne battery and the utility of the concept of overinclusiveness have been criticized by several theorists and investigators on both methodological and theoretical grounds (Marshall, 1973; Foulds *et al.*, 1967; Broen, 1966; Hawks and Payne, 1972).

The present investigation was undertaken to evaluate the Payne battery and the theory of overinclusiveness from another point of view. Recent clinical research has raised the issue that thought disorder and even Schneiderian first rank symptoms may be observed in mania as well as schizophrenia (Carpenter *et al.*, 1973; Ollerenshaw, 1973; Andreasen *et al.*, 1974).

In view of such symptoms as flight of ideas, euphoria, and grandiosity in mania, one might readily hypothesize that manics would also be overinclusive on specific testing. Further, Payne's research did not include diagnostic criteria, and his positive findings were limited to 'acute schizophrenics'. Without careful screening and sample definition, one must wonder if his findings could be skewed by a heavy loading of schizoaffectives or even manics. Other recent clinical research has repeatedly raised a question of whether acute schizophrenia or schizoaffective disorder may not be either a variant of affective

disorder or a third illness rather than a form of schizophrenia (Clayton *et al.*, 1968; Fowler *et al.*, 1972; McCabe *et al.*, 1971), making careful definition of patient sampling an important issue. Thus the present investigation was undertaken to test the hypothesis that overinclusive thinking would be at least as common in a carefully defined manic sample as in a carefully defined schizophrenic sample.

### METHOD

The sample consisted of 31 acute admissions, 15 schizophrenics and 16 manics, and of 15 normal controls. Prior to testing the patients were screened by one of the investigators with a structured psychiatric interview. Patients were included in the study if they met the following criteria:

*Schizophrenia*: (1) Absence of mood disturbance (depression or elation); (2) at least one of three cognitive symptoms (Schneiderian first rank symptoms, delusions, or auditory hallucinations) in the absence of recent drug intake or excessive use of alcohol; (3) at least one of three behavioural symptoms (social withdrawal, poor work history, poor heterosexual adjustment); (4) incomplete remission between episodes.

*Mania*: (1) At least four out of eight symptoms of mood disorder (racing thoughts, grandiosity, pressure of speech, increased sociability, early awakening, increased sex drive, irritability, financial extravagance); (2) duration of symptoms greater than two weeks; (3) history of periods of at least five depressive symptoms for more than three weeks (dysphoric mood, decreased appetite, weight loss, decreased sex drive, insomnia, diurnal rhythm, suicidal thoughts, crying spells, guilt feelings, decreased concentration), including at least two physiological symptoms; (4) full remission between episodes.

The manic and schizophrenic groups did not differ significantly in number of admissions to



hospital, age, or educational background. Eleven of the manics and ten of the schizophrenics had had prior admissions. The schizophrenics were slightly younger, with a mean age of 27, as compared with a mean of 32 for the manics. Both groups had a mean of 12.5 years of formal schooling. The schizophrenics were divided into eight hebephrenics and seven paranoids. All patients had been admitted because of the recent recurrence or emergence of psychotic symptoms.

The control group consisted of fifteen individuals who had no history of psychiatric disorder selected because they were similar to the patient sample in age and educational background. The control subjects had a mean age of 33 and a mean of 13.8 years of formal schooling.

All subjects were given the Payne battery of tests for overinclusive thinking (Payne and Friedlander, 1962), with some modifications. Ten rather than fourteen proverbs were used, drawing from a series in the *Mental Examiners' Handbook* (Wells and Ruesch, 1945). Subjects were timed, and their interpretations were tape-recorded and later transcribed. The 'handing over' section of the Goldstein-Scheerer Object Sorting Test was used as described by Payne, but with a total of eight rather than four starting points, all of which were predetermined by the examiners. The Payne method of administering the Object Classification Test was followed exactly, though examiners had to construct their own set of test materials, since these are not available in standardized form.

The tests were administered to the patients while their symptoms were still present, typically five to ten days after admission. Most patients were too severely disturbed to be tested immediately after admission, and most were receiving phenothiazines, haloperidol or lithium carbonate at the time of testing.

Data were analysed using 't' tests (two-tailed) to compare the various groups. Proverb interpretation was analysed in terms of mean number of words used to interpret each of the ten proverbs. Object sorting was analysed in terms of mean number of objects selected for each of the eight sortings. The Object Classifica-

tion Test was examined in terms of total number of sortings and number of 'Non-A' sortings, as defined by Payne and Hewlett (1960). These raw data were also examined using log transformations to arrive at a 'transformed score', using their methodology (Payne and Hewlett, 1960). The scores obtained by the hebephrenics and paranoids were compared, but no marked differences were noted; therefore the data obtained from schizophrenics were pooled.

### RESULTS

In general, manic patients tended to demonstrate more overinclusiveness than schizophrenic patients. As indicated in Table I, manics used a mean of 43.19 words to interpret each proverb, as compared with only 17.47 for schizophrenics, a difference significant at the .001 level. Although the manics tended to speak more rapidly, the difference in rate of speech between the two groups is not statistically significant. Thus the greater productiveness of the manics is not due to greater fluency or responsiveness.

Likewise, the manics were significantly more overinclusive in object sorting. Manics selected a mean of 8.04 objects in response to each of the starting points, whereas the schizophrenics selected a mean of 2.32 objects in each sorting, a difference significant at the .01 level.

The object classification test was of least value in differentiating the two groups. Manics made an average of 5.38 different classifications; schizophrenics made a mean of 3.80 classifications, 2.47 of which were 'Non-A'. Neither of these differences is statistically significant.

As this table shows, the dispersion of values on all tests is rather wide. Payne attempted to normalize the curves and minimize the variance by using log transformations. Table II summarizes the data obtained from the two patient groups and from the normal controls when analysed by this method. Table III compares the transformed scores obtained by the three groups. When transformed scores are compared, manics are significantly more overinclusive than the schizophrenics in two out of the three subtests and in total transformed score. Total score and proverb interpretation differ at the .001 level and object sorting at the .01 level.

TABLE I  
*Overinclusiveness on specific subtests*

|                                               |           | Schizophrenics | Manics | t    | p    |
|-----------------------------------------------|-----------|----------------|--------|------|------|
| N                                             |           | 15             | 16     |      |      |
| Words/proverb                                 | $\bar{x}$ | 17.47          | 43.19  | 3.89 | .001 |
|                                               | SD        | 11.26          | 22.97  |      |      |
| Words/minute                                  | $\bar{x}$ | 56.12          | 78.51  | 1.63 | N.S. |
|                                               | SD        | 27.60          | 34.16  |      |      |
| Object sorting (Goldstein Scheerer)           | $\bar{x}$ | 2.32           | 8.04   | 3.41 | .01  |
|                                               | SD        | 1.43           | 6.75   |      |      |
| Object classification (total no. of sortings) | $\bar{x}$ | 3.80           | 5.38   | 1.76 | NS   |
|                                               | SD        | 1.97           | 2.94   |      |      |
| Object classification (non-A sortings)        | $\bar{x}$ | 2.47           | 3.75   | 1.40 | NS   |
|                                               | SD        | 1.96           | 3.04   |      |      |

TABLE II  
*Transformed overinclusion scores\**

|                                        |           | Schizophrenics | Manics   | Normals  |
|----------------------------------------|-----------|----------------|----------|----------|
| N                                      |           | (N = 15)       | (N = 16) | (N = 15) |
| Sum of transformed scores              | $\bar{x}$ | 4.20           | 9.81     | 6.79     |
|                                        | SD        | 2.51           | 3.66     | 3.96     |
| Proverbs                               | $\bar{x}$ | 3.20           | 5.94     | 4.00     |
|                                        | SD        | 1.90           | 1.84     | 1.68     |
| Object sorting                         | $\bar{x}$ | 0.47           | 2.86     | 2.46     |
|                                        | SD        | 0.99           | 2.73     | 1.12     |
| Object classification (non-A sortings) | $\bar{x}$ | 0.53           | 0.93     | .33      |
|                                        | SD        | 0.64           | 1.12     | 1.04     |

\* Transformations based on method of Payne and Friedlander (1962).

TABLE III  
*Comparison of transformed overinclusion scores in manics, schizophrenics, and normals*

|                            |    | Sum of transformed scores |      | Proverbs |      | Object sorting |      | Object classification (non-A sortings) |    |
|----------------------------|----|---------------------------|------|----------|------|----------------|------|----------------------------------------|----|
|                            |    | t                         | P    | t        | P    | t              | P    | t                                      | P  |
| Manics vs. schizophrenics  | .. | 5.01                      | .001 | 4.07     | .001 | 3.31           | .01  | 1.24                                   | NS |
| Normals vs. manics         | .. | 2.13                      | .05  | 2.95     | .01  | .51            | NS   | 1.49                                   | NS |
| Normals vs. schizophrenics | .. | 2.06                      | .05  | 1.77     | NS   | 4.98           | .001 | .612                                   | NS |

Table III also indicates that the manic sample tends to be overinclusive and the schizophrenic sample underinclusive as compared with the normal controls, although the differences are not nearly so striking as those between manics and schizophrenics. Manics are more overinclusive than normals at the .01 level in proverb interpretation and at the .05 level in total transformed score, but the two groups do not differ significantly in object sorting or Non-A sortings. On the other hand, the schizophrenics earned a significantly lower total transformed score ( $P < .05$ ) than the controls, indicating their general underinclusiveness. In particular, the object sorting test contributed heavily to this total score, since the two groups differed on this test at the .001 level, while the other two tests were not significantly different.

Our findings from schizophrenics do not replicate those of Payne and his associates, although his methods were followed quite closely. Payne's transformed overinclusion scores for normals, depressives, and schizophrenics are summarized in Table IV. Scores earned by our schizophrenics are similar to those of his normals and depressives, while our manics performed much like his schizophrenics. Our normals had a significantly higher transformed score than his normals on proverb interpretation ( $P < .01$ ), but did not differ significantly on total transformed score or on other subtests.

### DISCUSSION

These data raise a number of issues.

(1) Our inability to replicate Payne's findings for overinclusiveness in schizophrenia could be due to a number of factors. Perhaps the most important is the difference in definition of the sample examined. Although Payne has not described diagnostic criteria for his acute schizophrenics, he has indicated that overinclusiveness remits with remission of the acute symptoms and that it could not be demonstrated in chronic schizophrenics. He does not seem to have excluded patients with prominent affective symptoms. In fact, when Hawks and Payne compared a group of 'clinically overinclusive' schizophrenics with a group who were 'not clinically overinclusive', the former showed a high correlation between overinclusiveness and motor activity, talkativeness, motor speed, hostility, and verbal responsiveness (Hawkes and Payne, 1971). Thus their overinclusive patients tend to fall in the schizoaffective—good prognosis category. Because of the controversy about whether these patients represent classical schizophrenia, we excluded patients with prominent affective symptoms from the schizophrenic group. Our schizophrenic sample was, therefore, more narrowly defined and probably more like the 'non-overinclusive patients' in the more recent Hawks and Payne study.

(2) Overinclusive thinking is probably not specific to schizophrenia, since it was quite prominent in the manics examined. Given

TABLE IV  
*Transformed overinclusion scores from Payne et al.\**

|                                         |           | Normals  | Depressives | Schizophrenics |
|-----------------------------------------|-----------|----------|-------------|----------------|
| N                                       |           | (N = 20) | (N = 20)    | (N = 20)       |
| Sum of transformed scores               | $\bar{x}$ | 4.80     | 5.65        | 10.25          |
|                                         | SD        | 1.47     | 1.66        | 5.00           |
| Proverbs                                | $\bar{x}$ | 2.50     | 3.00        | 4.45           |
|                                         | SD        | 0.68     | 1.37        | 5.31           |
| Object sorting                          | $\bar{x}$ | 2.10     | 2.05        | 3.75           |
|                                         | SD        | 1.78     | 1.00        | 4.65           |
| Object classification (non-A responses) | $\bar{x}$ | 0.20     | 0.60        | 2.05           |
|                                         | SD        | 0.27     | 2.46        | 3.63           |

\* Data summarized from Payne and Friedlander (1962) and Payne and Hewlett (1960).

Payne's inability to demonstrate overinclusiveness in many types of schizophrenia (chronic, remitted, 'clinically nonoverinclusive', etc.), it should not be considered an index of 'psychoticism', even if it can be demonstrated in manics as well.

(3) Since overinclusive thinking has been noted in patients with mania and acute schizophrenia (or perhaps schizoaffective disorder), it may perhaps be more closely related to affective disorder than to schizophrenia. Hawks and Payne noted that patients with overinclusive thinking tend to have a better prognosis (Hawkes and Payne, 1971), and this would fit in with our finding that it is more prominent in manics than in narrowly-defined schizophrenics.

#### SUMMARY

Thirty-one patients, 16 manics and 15 schizophrenics, and 15 normal controls were evaluated with the Payne battery of tests for overinclusive thinking. The manics showed significantly more overinclusive thinking than the schizophrenics on two out of three tests in the battery and on total transformed score. Schizophrenics were underinclusive when compared with normal controls, and manics were overinclusive. These data suggest that overinclusiveness is not specific to schizophrenia and that it is associated with illnesses which remit or have a good prognosis.

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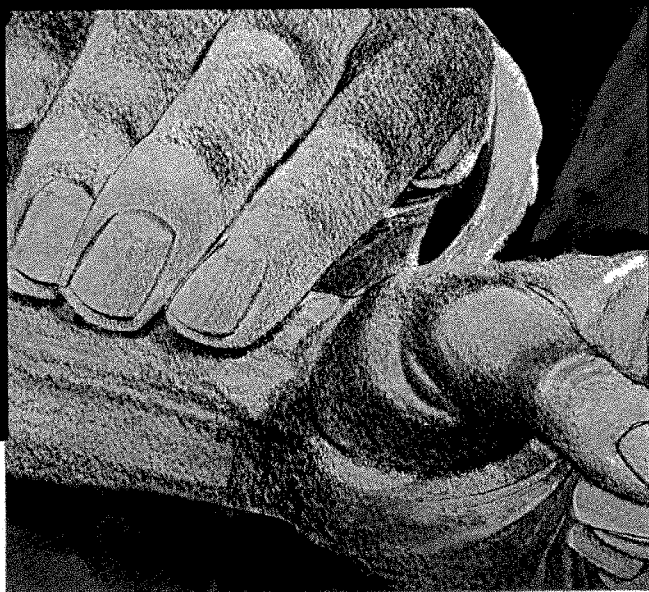
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(Received 31 December 1973)

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# Urinary Cyclic AMP in the Switch Process from Depression to Mania

By R. P. HULLIN, J. G. SALWAY, M. N. E. ALLSOPP, G. DAWN BARNES,  
JANET D. M. ALBANO and B. L. BROWN

Various reports have suggested that the urinary excretion of adenosine cyclic 3'5' monophosphate (cyclic AMP) is increased in mania and decreased in depression. However, our own serial studies from short-cycle bipolar manic-depressive patients showed no correlation between mood and cyclic AMP excretion (2). Jenner *et al.* (4) confirmed our findings, except in the case of a patient with a regular 48-hour mood cycle who did show a correlation between his

mood changes and changes in cyclic AMP excretion. Paul *et al.* (5) also reported a general lack of correlation between these variables, but found a transient increase of urinary cyclic AMP during the rapid switch from depression to mania. We have investigated the situation in a bipolar patient who shows such a rapid switch in mood but have been unable to demonstrate any increase in cyclic AMP excretion during the switch period.

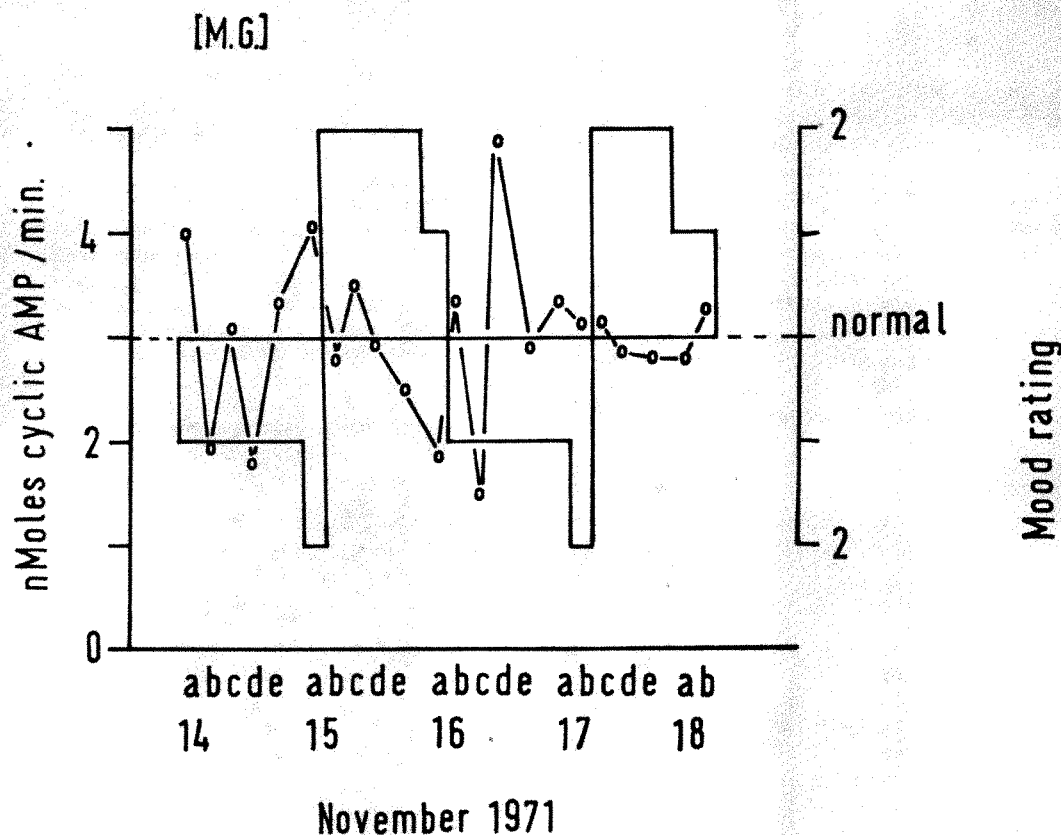


FIG. 1.—Diurnal variation of cyclic AMP excretion and mood rating in a manic-depressive patient. The mood is shown by open blocks and urinary cyclic AMP excretion by o—o. Times of collection are indicated as follows:  
a = 6 a.m.—10 a.m. b = 10 a.m.—2 p.m. c = 2 p.m.—6 p.m. d = 6 p.m.—10 p.m. e = 10 p.m.—6 a.m.



## PATIENT AND METHODS

The patient (M.G.) was a pre-menopausal female, aged 42, who regularly exhibited a very short cycle consisting of 36 hours of depression and a rapid switch commonly occurring in less than 30 minutes in the early afternoon to hypomania which was then maintained for a further 36 hours.

During the investigations a constant dietary intake of water, sodium and potassium was maintained, and caffeine-containing drinks were limited to the infusate from 7.5 g. of tea at 8 a.m., 12 noon and 5 p.m. and 3 g. of instant coffee at 10 a.m. The affective state of the patient was assessed daily as described previously (3) on a simple five-point scale during each four-hourly interval of the period of study.

Urine, cooled to 4° until after collection was completed, was then deep-frozen pending cyclic AMP determination as previously described (2). Creatinine was determined by the method of Bonsnes and Taussky (1).

## RESULTS

The 24-hour urinary excretion of cyclic AMP in serial studies was always within the normal range (1.65–6.0  $\mu$ Moles) found previously (2), although marked differences in the daily affective pattern were occurring (details are available upon request). During the period of 24-hour urinary collections, there occurred four rapid switches from depression to mania and four from mania to depression, but no marked changes in cyclic AMP excretion were associated with any of the switch days.

In an extension of the study, cyclic AMP concentrations were determined in consecutive 4-hourly urine collections in order to investigate the possibility that a transient increase in excretion of cyclic AMP associated with the rapid-switch might be obscured against the background of excretion over a 24-hour period. The results, shown in the figure, again demonstrated that rapid changes of mood were not consistently accompanied by changes in cyclic AMP excretion.

## DISCUSSION

The results with this patient provide further evidence that variations of urinary excretion of cyclic AMP are not always related to mood, as was originally suggested. Furthermore, the transient increase of urinary cyclic AMP excretion associated with a rapid change from depression to mania found by Paul *et al.* (5) in six of seven episodes studied did not occur in our patient. Calculation of the results in terms of  $\mu$ Moles cyclic AMP excreted per g. of creatinine also showed no correlation between cyclic AMP and mood.

## ACKNOWLEDGEMENTS

We are grateful to Mr. M. Tonkin, the nursing staff and the laboratory staff of the Regional Metabolic Research Unit, High Royds Hospital for their help and to the Medical Research Council for financial support under a programme grant to one of us (RPH). The patient was under the clinical charge of Dr. R. McDonald to whom we are greatly indebted.

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## Glucose and Adenosine Triphosphate Level in Normal Subjects

By J. DAMAS MORA, D. VLISSIDES and F. A. JENNER

In *Orthomolecular Psychiatry; Treatment of Schizophrenia*, edited by David Hawkins and Linus Pauling (1973), Beebe and Wendel (pp. 278-302) report a high correlation coefficient of  $r = 0.99$  (which we calculate gives  $N = 42$ ,  $p$  very much lower than 0.001) between whole blood glucose and adenosine triphosphate (ATP). This relationship they claim is no longer maintained in schizophrenics with anxiety,  $r = 0.16$  ( $N = 62$ ,  $p > 0.1$ ). Erban and Hanzlicek (1966), Hansen (1972) and Hansen and Dimitrakoudi (1974) have suggested a possible significance of whole blood ATP in psychoses, and Naylor, Dick, Dick, Le Poidevin and Whyte (1973) have implicated red cell Na/K ATPases. The mechanisms involved in controlling blood ATP seemed therefore worthy of study especially if they are so dependent on glucose.

### METHOD

Only control persons were studied. They were the staff of this research unit and ranged in age from 19 to 53. They were studied fasting, after ordinary meals, and after glucose tolerance tests lasting 3 hours and following 50 G ( $N = 24$ ) or 100 G ( $N = 35$ ) glucose by mouth. On all the blood specimens, glucose was estimated by glucose oxidase method using O-Dianisidine (Varley, 1969), and ATP by the phosphoglycerate kinase method (Adam, 1962).

### RESULTS AND DISCUSSION

Fig. 1 shows our findings which produce a  $r = -0.054$  ( $N = 84$ ) and hence a  $p$  value is non-significant for a correlation between whole blood ATP and glucose. The line from Beebe and Wendel (1973) (their Fig. 13.3) is included in the graph for comparison. As the conflict in control findings is so great we have not proceeded to study patients.

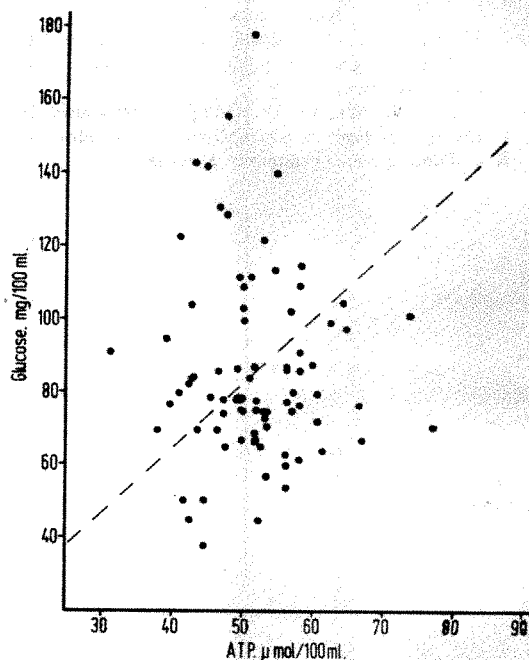


Fig. 1.—The points represent estimations of whole blood adenosine triphosphate and glucose, the line is taken from the publication of Beebe and Wendel (1973) which could not be obtained from these results.

We feel justified in reporting these striking differences in findings, but cannot account for the gross discrepancy. The only difference in method is that our glucose tolerance tests studied a shorter period, but by 2 hours the glucose levels had usually returned to normal.

It is difficult to know, of course, where the adenosine part of the ATP molecule comes from in rapid changes in red cells except from the limited supply of AMP and ADP ( $m = \text{mono}$ ,  $D = \text{Di}$ ) (see e.g. Brewer, 1969). Perhaps the red cells are replenished from the liver or some other source, a possibility on which we would not choose to speculate.

## SUMMARY

A failure is reported in attempts to repeat the findings of Beebe and Wendel (1973) that glucose levels in serum and ATP levels in blood are highly correlated in normal persons compared to anxious schizophrenics. No correlation could be found even in normal subjects themselves.

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## Antibody Levels to Herpes Simplex Type 1, Measles and Rubella Viruses in Psychiatric Patients

By P. E. HALONEN, R. RIMON, KATVE AROHONKA and V. JÄNTTI

The systematic search of aetiological agents from a variety of slowly progressing or subacute neurological diseases has revealed causative viruses or virus-like agents from kuru, Creutzfeldt-Jacob disease and other forms of presenile dementias, subacute sclerosing panencephalitis, progressive multifocal encephalopathy, and from many similar neurological diseases in animals (Gajdusek and Gibbs, 1973; Gajdusek, 1973). The first two diseases called subacute spongiform virus encephalopathies (Gajdusek and Gibbs, 1971) have many interesting features including heredo-familial occurrence and totally non-inflammatory neuropathology. Thus the epidemiology of these diseases is not typical for diseases with infectious aetiology, and the histopathological studies do not suggest the presence of extremely high-titred infectious material in brain cells.

In contrast to the great interest now being taken in the search for possible viral agents in many neurological diseases of unknown aetiology, much less attention has been paid to a possible relationship between slow or latent virus infections in the central nervous system and psychiatric disorders. In 1964, Shearer and Finch presented a patient who showed signs of encephalitis and also developed vesicular herpes simplex stomatitis simultaneously with 17 recurrent psychotic episodes. Later, in two reports, Rimon and Halonen (1969) and Rimon *et al.* (1971) demonstrated significantly higher level and greater rate of complement-fixing antibody to herpes simplex virus in patients with psychotic depression than in patients with other psychiatric diseases or healthy medical personnel. Cleobury *et al.* (1971) compared 13 aggressive psychopaths with 27 other psychiatric or other general hospital patients. They found an unusually

high mean kinetic neutralization constant against type 1 herpes simplex virus but not against type 2 in patients with aggressive personality deviation.

In the present report an effort is made to stimulate interest in elucidating possible viral aetiology of various psychiatric diseases by reporting significantly increased levels of herpes simplex type 1 neutralizing antibody in psychiatric patients, most markedly in patients with psychotic depression.

### PATIENTS AND METHODS

Serum specimens were collected from three psychiatric hospitals in Southern and Eastern Finland. Altogether 318 specimens were from psychiatric patients (mean age 49 years) and 32 from healthy medical personnel (mean age 34 years) of the same hospitals. However, since each serum specimen could not be tested with each serological technique the final number of specimens was 348 in rubella haemagglutination inhibition test, 349 in measles haemagglutination inhibition test, and 174 in herpes simplex type 1 neutralization test.

All patients in the various diagnostic subgroups were either short-admission or medium-stay cases. From the 56 specimens of the group with psychotic depression tested for neutralizing type 1 herpes simplex antibody, 24 were from patients in the depressive phase of manic-depressive psychosis, 10 from patients with involutional depression, and 22 from patients with other forms of depressive illness with delusional thought content indicating a disturbance at psychotic degree. The medical personnel from whom specimens were collected lived in the hospital areas or in the communities nearby.

Measles haemagglutination inhibition test was carried out from kaolin-adsorbed serum specimens with microtechnique (Sever, 1962). Rubella haemagglutination inhibition test was done according to Halonen *et al.* (1967). Four units of haemagglutinin were used in each haemagglutination inhibition test. Herpes simplex type 1 plaque neutralization test

was done according to Pohjonen (1970), except that VERO cells were used instead of primary rabbit kidney cells, and virus diluent was Hanks' solution with 0.2 per cent bovine serum albumin fraction V. Type 1 herpes simplex virus strain was MacIntyre VR no. 3. Virus was diluted to contain about 100 plaque-forming units per ml. Serum specimens were inactivated at 56 °C for 30 minutes. Equal volumes of virus and serial two-fold dilutions of serum, starting from 1:10, were mixed, incubated at room temperature for one hour, and 0.2 ml. of the mixtures were inoculated into 6 mm. Petri dishes with monolayer culture of VERO cells.

After one hour incubation at room temperature 6 ml. of overlay containing 1 per cent carboxymethylcellulose and 5 per cent calf serum in Eagle's Basal Medium was added and the Petri dishes were incubated at 37 °C in 5 per cent CO<sub>2</sub> for five days. Plaques were counted after staining with crystal violet. Control titrations of virus and immune serum was included in each test.

Rubella and measles haemagglutination inhibition titres were statistically analyzed from logarithmic values according to Student's t-test. Herpes simplex type 1 neutralization k-values with non-normal

distribution were analysed according to the one-tailed Mann-Whitney U-test (Siegel, 1956).

### RESULTS

The mean titres of rubella haemagglutination inhibition test were not significantly different in the psychiatric groups compared with the medical personnel, as shown in Table I.

Similar results were obtained with measles haemagglutination inhibition test (Table II), but the mean titres were slightly lower in each psychiatric group than in the medical personnel, the difference being statistically significant only in the group of personality disorders ( $p < 0.05$ ).

The k-values of herpes simplex type 1 antibody were higher in each of the psychiatric groups than in the medical personnel (Table III). This difference was highly significant ( $p < 0.001$ ) in patients with psychotic depression, but also significant in the schizophrenia group ( $p < 0.01$ ) and in the group of other psychiatric diseases ( $p < 0.05$ ). In addition to the high median k-values, many

TABLE I

*Rubella haemagglutination inhibition antibody titres in 348 serum specimens of psychiatric patients and medical personnel*

| Group                    | Number of subjects | Geometric mean titer | SEM log | P compared to medical personnel |
|--------------------------|--------------------|----------------------|---------|---------------------------------|
| Psychotic depression ..  | 88                 | 39 (+101, -29)*      | 0.05986 | N.S.                            |
| Schizophrenia ..         | 75                 | 31 (+94, -21)        | 0.06865 | N.S.                            |
| Neurotic syndromes ..    | 80                 | 36 (+102, -27)       | 0.06539 | N.S.                            |
| Personality disorders .. | 74                 | 28 (+55, -18)        | 0.05472 | N.S.                            |
| Medical personnel ..     | 31                 | 36 (+87, -26)        | 0.09681 | —                               |

\* Asymmetry due to standard deviation being calculated on logarithmic titer values.

TABLE II

*Measles haemagglutination inhibition antibody titres in 349 serum specimens of psychiatric patients and medical personnel*

| Groups                   | Number of subjects | Geometric mean titer | SEM log | P compared to medical personnel |
|--------------------------|--------------------|----------------------|---------|---------------------------------|
| Psychotic depression ..  | 88                 | 123 (+545, -105)*    | 0.07820 | N.S.                            |
| Schizophrenia ..         | 75                 | 160 (+531, -123)     | 0.07340 | N.S.                            |
| Neurotic syndromes ..    | 81                 | 143 (+525, -112)     | 0.07431 | N.S.                            |
| Personality disorders .. | 74                 | 104 (+319, -78)      | 0.07087 | 0.05                            |
| Medical personnel ..     | 31                 | 191 (+513, -139)     | 0.10160 | —                               |

\* Asymmetry due to standard deviation being calculated on logarithmic titer values.

TABLE III

*Herpes simplex type 1 k-values of kinetic neutralization test in 174 serum specimens of psychiatric patients and medical personnel*

| Group                                                                  |    | Number of subjects | Median | Maximum | U   | Z compared to medical personnel | P      |
|------------------------------------------------------------------------|----|--------------------|--------|---------|-----|---------------------------------|--------|
| Psychotic depression                                                   | .. | 56                 | 1.1    | 7.8     | 546 | 3.05                            | <0.001 |
| Schizophrenia                                                          | .. | 54                 | 1.2    | 5.7     | 573 | 2.63                            | <0.01  |
| Other psychiatric diseases (neurotic syndromes, personality disorders) | .. | 32                 | 0.89   | 3.6     | 365 | 1.99                            | <0.05  |
| Medical personnel                                                      | .. | 32                 | 0.29   | 2.4     |     |                                 | —      |

Titer distribution was analysed statistically according to the one-tailed Mann-Whitney U-test (Siegel, 1956). U is the statistic of the test. Z is the difference of the mean of the sampling distribution of U and the computed U in standard deviations. The sampling distribution of U is approximately the normal distribution.

serum specimens in the depression group had unusually high k-values and 15/56 (27 per cent) were higher than 2.4 which was the highest k-value in the group of medical personnel. The highest k-values in the schizophrenia group were not as high as in the depression group, but there were 13/54 (24 per cent) specimens with higher values than the highest in the medical personnel.

The 13 psychopaths in the group of 32 other psychiatric diseases had not significantly higher k-values than the medical personnel and the highest k-value was 3.2.

#### DISCUSSION

The results of the present study clearly indicate that a considerable number of patients with psychotic depression have unusually high neutralizing antibody levels to herpes simplex type 1 virus. Thus these results are in agreement with our earlier observations indicating greater rate of high complement-fixing antibody titres of herpes simplex virus in patients with psychotic depression than in controls. Recently, these findings have been confirmed in another laboratory by Lycke *et al.* (1974), who demonstrated higher prevalence of complement-fixing antibodies to herpes group of viruses in patients with depressive psychoses (herpes simplex, cytomegalo, varicella-zoster) and in patients with dementia (herpes simplex, cytomegalo) than in the controls. In their study mean titres against herpes simplex were also significantly higher

in the groups of depressive and demented patients.

The mean titres of rubella antibody in the groups of patients (28-39) and in the medical personnel (31) are within the same range as found earlier in Finland in normal population of comparable age groups (Salmi *et al.*, 1970) and the same is true with the measles antibody titres found in this study (Panelius *et al.*, 1971).

As a rational explanation to our findings it would be tempting to say that there is an aetiological relationship with the unusual herpes simplex antibody pattern and psychotic depression in some of the patients. However, we have no direct evidence to support such a hypothesis, but before other interpretations are available the aetiological possibilities must be considered. The fact that neither measles nor rubella antibody titres are increased in psychotic depression rules out a possibility for a general change in circulating antibody in these patients and thus enlarges the importance of the findings with herpes simplex virus and probably other herpes viruses.

As we have suggested earlier (Rimon and Halonen, 1969; Rimon *et al.*, 1971), a similar aetiological relationship as with slow virus infections and neurological diseases should be systematically searched for in psychiatric diseases also. In this search, all known viruses isolated from the central nervous system must be included in the serological tests, and even new viruses should be sought with primate

inoculations and by other means. Approaching this problem with serological techniques, several tests measuring different antibodies of the same virus should be used. This was demonstrated in our present study by the increased neutralizing antibody of herpes simplex virus in schizophrenia and possibly in the group of other psychiatric diseases which had not been shown by complement-fixation technique in our two previous studies. Great individual variations in measles antibody pattern of patients with subacute sclerosing panencephalitis (SSPE) and multiple sclerosis has been found by Salmi *et al.* (1972) when serum and cerebrospinal fluid specimens were tested with neutralization, haemagglutination inhibition, haemolysis-inhibition, complement fixation and immunodiffusion techniques, each measuring more or less different antibodies of the same virus. Findings in SSPE indicate that the aetiological agent in slow virus infections of the central nervous system may be in an incomplete form in which no mature infectious virus is found. In such an unusual type of infection, especially if it is not as fulminating as in SSPE, the immunological response may not be typical for this virus in regular infection, and this unusual infection may cause difficulties in serological studies even with well-known viruses.

The increased level of neutralizing herpes simplex antibody in schizophrenia and in the group of other psychiatric diseases (neurotic syndromes, personality disorders), although less marked than in the depression group, must be further studied before its significance can be discussed. The same is true for the decreased level of measles antibody which was found consistently in each psychiatric group.

#### SUMMARY

Serum specimens from 318 psychiatric patients and 32 healthy medical personnel (controls) were collected for herpes simplex type 1 virus plaque neutralization test, measles haemagglutination inhibition and rubella haemagglutination inhibition tests. The k-values of herpes simplex type 1 antibody were significantly higher in 56 patients with psychotic depression than in 32 controls ( $p < 0.001$ ), and 15/56 (27 per cent) of the patients with depression had higher

antibody values than the highest value in the controls. These results confirm the earlier similar findings with herpes simplex complement fixation test.

In 54 patients with schizophrenia and in 32 patients with other psychiatric diseases (neurotic syndromes, personality disorders), the k-values of herpes simplex type 1 antibody were also significantly higher than in the controls, but the difference was not as marked as in the patients with psychotic depression. Similar findings in schizophrenia had not been found in two previous studies with complement fixation technique. The mean rubella antibody titres were not significantly higher in the patients with psychotic depression than in the controls, whereas the mean measles haemagglutination inhibition titres were lower in each psychiatric group tested than in the controls, but the difference was significant only in the group of patients with personality disorders.

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(Received 8 October 1973)

## Psychiatric Illness in the Mothers of School-Phobic Adolescents

By IAN BERG, ALAN BUTLER and JANICE PRITCHARD

This paper reports a study of maternal psychiatric illness in school-phobic adolescents admitted to a psychiatric in-patient unit. These cases have been previously described and studied in various ways (Berg, Nichols and Pritchard, 1969; Berg, 1970; Berg and McGuire, 1971; Berg, Butler and McGuire, 1972; Berg and McGuire, 1974).

### PROCEDURE

A hundred school-phobic youngsters were compared with 113 admitted non-school-phobic cases.

Item sheets which had been routinely completed on admission to the Unit by psychiatric social workers were used to get information about any history of psychiatric illness in the mothers of the affected youngsters. The results were carefully checked.

General practitioners of mothers with a positive psychiatric history were sent a letter asking for some details of the disturbances. The response rate was just over 80 per cent. From all the information available, the illness of mothers was classified as an affective disorder when it was described mainly in terms of anxiety, depression or phobias. Two of the writers independently categorized mothers in this way. There was disagreement in four instances which was resolved after discussion on the available data.

### RESULTS

Of the 100 school-phobics, 79 were living with both of their parents, 19 with mother but without father, 1 with father without mother and 1 elsewhere. Of the 113 non-school-phobics, 68 were with both parents, 31 with mother without father, 4 with father without mother and 10 elsewhere. These differences between school-phobics and non-school-phobics were not significant as far as the boys were concerned (43 out of 56 school-phobics, 41 out of

58 non-school-phobics, were with both parents.) There was a significant excess of school-phobic girls (36 out of 44) living with both parents, compared with non-school-phobic girls (27 out of 55,  $\chi^2 = 10.0$ ,  $P < 0.01$ ).

Of the mothers of the 56 school-phobic boys, 22 were considered psychiatrically ill, and 3 of them had seen a psychiatrist; 15 of the 22 were categorized as suffering from an affective disorder. Of the mothers of the 58 non-school-phobic boys 21 were thought to be psychiatrically disturbed, and 11 of them had seen a psychiatrist; 10 were classified as affective disorders. Differences between school-phobic and non-school-phobic groups were not statistically significant.

Of the mothers of the 44 school-phobic girls 22 were considered psychiatrically ill and 9 of them had been to a psychiatrist; 14 had an affective disorder. Of the mothers of the 55 non-school-phobic girls 22 were thought to be psychiatrically ill, and 9 of them had seen a psychiatrist; 13 had an affective disorder. None of the differences between school-phobic and non-school-phobic groups were significant.

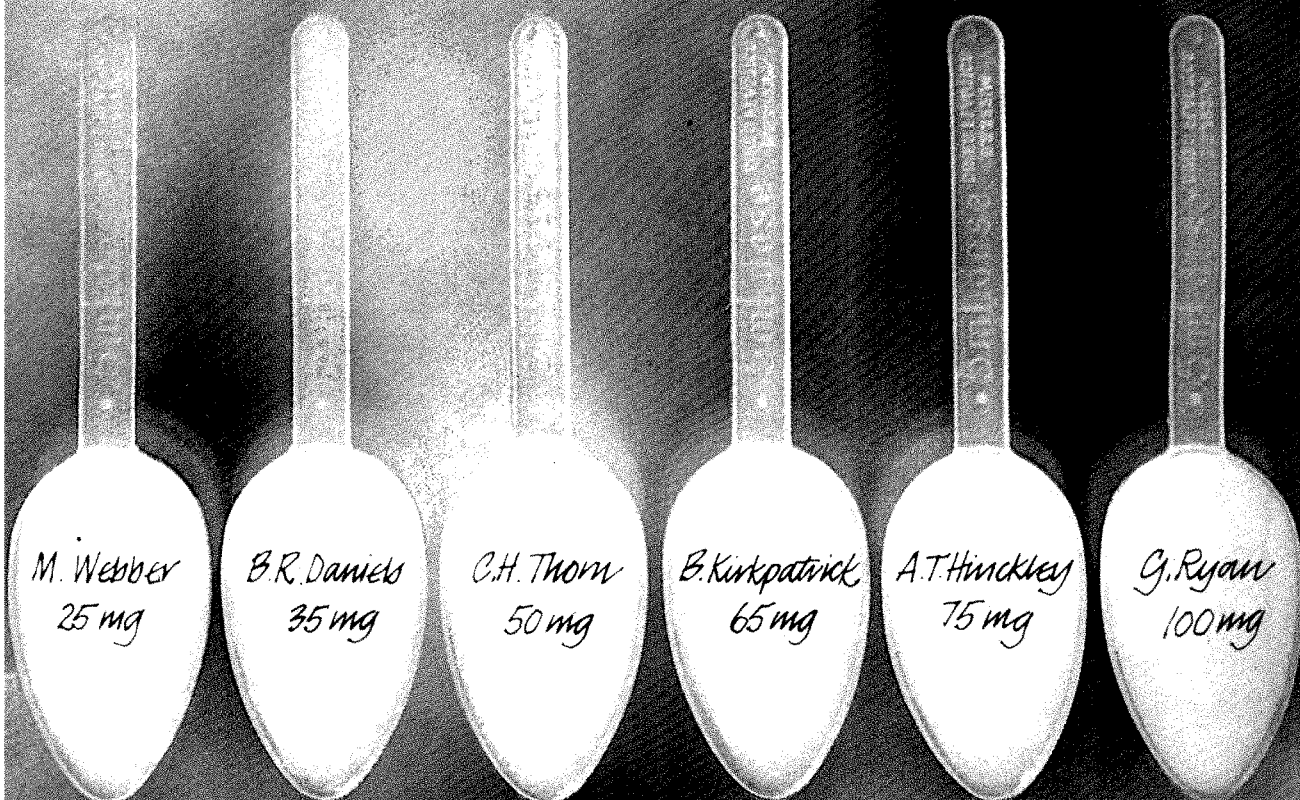
Psychiatric illness in fathers was also looked at, using the item sheets. Eight of the 56 school-phobic boys had fathers with a history of psychiatric illness, 4 of whom had seen a psychiatrist. Seven of the 58 non-school-phobic boys had fathers with psychiatric illness, and 3 of them had been to a psychiatrist. Five of the 44 school-phobic girls had fathers who had suffered a psychiatric illness of whom 4 had seen a psychiatrist. Seven of the 55 non-school-phobic girls had fathers with psychiatric illness, 5 of whom had been to a psychiatrist. None of these differences were statistically significant.

### COMMENT

The overall incidence of one in five (22 per cent) parents with psychiatric disorder, defined in terms of psychiatric clinic attendance, is



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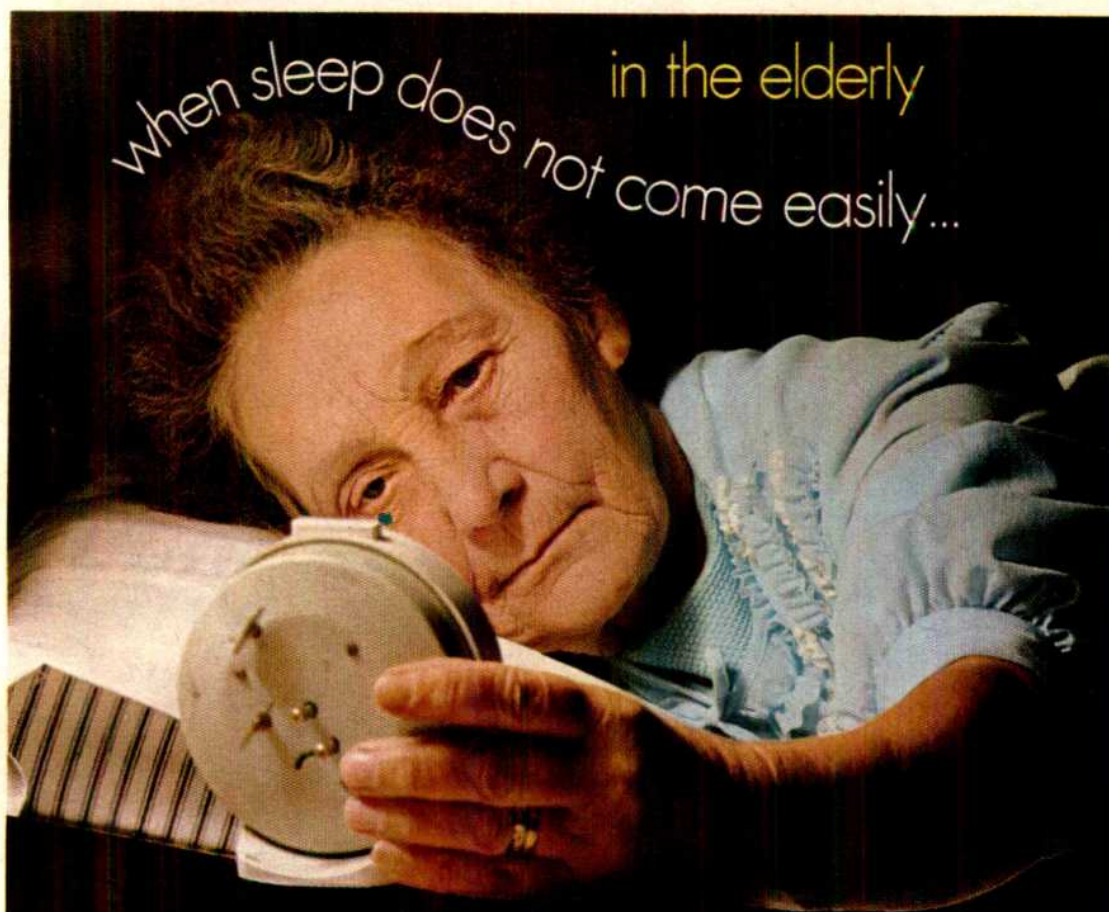


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higher than would be expected in a group of normal youngsters and is similar to that found in disturbed children previously; the same can be said about the predominance of mentally ill mothers over fathers (Rutter, 1966).

The finding that the school-phobic girls were more likely to have intact families than non-school-phobic cases is in keeping with previous investigations (Hersov, 1960).

The fact that an affective disorder occurred in over half the mentally ill mothers of both school-phobic and a similar proportion of non-school-phobic cases is in general agreement with previous investigations which have usually failed to find any association between type of childhood disorder and the sort of parental mental illness which may occur (Rutter, 1966).

#### SUMMARY

Maternal psychiatric illness was investigated in a hundred school-phobic youngsters and 113 non-school-phobic cases admitted to an adolescent unit, using hospital records and letters to general practitioners. Paternal mental illness was also looked at using case records.

About a fifth of parents had a history of psychiatric disorder in both groups. Over half the affected mothers in each group had suffered from an affective disorder. It was not possible to relate school phobia to the type of maternal mental illness. All the findings were in accordance with previous work.

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## Wilfulness in School-Phobic Adolescents

By IAN BERG and TONY COLLINS

School-phobic youngsters have sometimes been described as wilful and stubborn in the family situation (Hersov, 1960), and this tendency has been invoked to explain the particular occurrence of school phobia in early adolescence (Leventhal and Sills, 1964). The emotional upset shown by these young people when faced with the prospect of going to school (Berg, Nichols and Pritchard, 1969), may occasionally appear to be more in the nature of anger, defiance and temper than either fearfulness or misery (Smith, 1970). The fact that in the general population dislike of school is reflected in actual absence only during the secondary school years (Mitchell and Shepherd, 1967) supports the view that assertiveness, which presumably becomes more effective as the child reaches the teens, plays some part in school refusal.

### PROCEDURE

A rating scale was devised to estimate the amount of oppositional behaviour shown by children. It consisted of the following twelve questions, each scored 0 to 7, according to the number of days in the previous week a positive response was relevant, at least once: (1) Did he stay in bed after he should have got up? (2) Did he stay up after he should have been in bed? (3) Did he want something other than you wanted him to eat? (4) Did he object to wearing the clothes you preferred him to wear? (5) Did he play with children he knew you thought undesirable? (6) Did he watch more TV than he knew you liked him to? (7) Did he object to helping about the house? (8) Did he spend his pocket money in ways you would rather he did not? (9) Did he go to places that you would rather he did not go to? (10) Did he interfere with things about the house that you would rather he did not? (11) Did he behave in ways you considered undesirable when visitors came to the house? (12) Did he behave in ways you considered undesirable when out visiting with you?

Mothers of youngsters admitted to a psychiatric in-patient unit for adolescents were given the

questionnaire to complete as part of a routine collection of relevant information. The data were punched on cards for analysis on the University of Leeds I.C.L. 1906A computer using a standard set of programs (Hamilton, McGuire, and Goodman, 1965). There were 43 school-phobic and 37 non-school-phobic cases. The criteria by which they were diagnosed and the clinical features of a proportion of them have been described previously (Berg, Nichols and Pritchard, 1969; Berg and McGuire, 1971).

### Reliability and validity

*Test-retest reliability* with intervals of from two weeks to two months between administrations gave a composite  $r = .92$  ( $n = 10$ ).

*Construct validity* was looked at by correlational and principal component analysis, carried out on the question scores of the total group of cases. The first component accounted for 27 per cent of total variance. It was positively loaded on all the questions and was a general resistiveness factor.

*External validity* was checked using routine assessments of the youngster's behaviour in the Unit. Fifteen school-phobic children had given evidence of tempers and aggressiveness towards their parents, during visiting, and fifteen other school phobics had shown no evidence of this. The wilful group had a significantly ( $P < 0.01$ ) higher mean total score on the resistiveness questionnaire (mean of 24) than the compliant group (mean of 14).

### RESULTS AND CONCLUSIONS

There were 44 boys and 36 girls in the total group; of these 22 were aged 11 or 12 and 58 were aged 13, 14 or 15. No sex, age, social class or school differences emerged from one way analyses of variance on the first five factor scores of the resistiveness questionnaire. Similarly, a straight comparison between school-phobic and non-school-phobic cases failed to reveal any significant differences on the first five factor scores.

When comparisons were made between the 24 acute school phobics (mean general factor

score = 46.1), the 19 chronic school phobics (mean = 50.2) differentiated as before (Berg, Nichols and Pritchard, 1969), 12 conduct disorders (mean = 58.8) and 25 other problems (mean = 48.8) differentiated by means of the discharge diagnosis, it was found that the conduct disorders were significantly more resistive ( $F = 4.7$ ;  $P < 0.01$ ).

The questionnaire was satisfactory from the point of view of reliability and validity. Bias was probably reduced by emphasizing actual evidence of oppositional behaviour in the recent past (Cattell, Wagners and Cattell, 1970; Oppenheim, 1966). The first component appeared to measure at least what mothers themselves considered to be resistive behaviour on the part of their children. The results do not support the view that school phobic youngsters are unduly wilful towards their parents compared to other psychiatric cases.

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## Antisocial Behaviour, Barbiturate Addiction and Associated Electroencephalographic Changes

By LETITIA WEST and M. V. DRIVER

### INTRODUCTION

Since the implementation in April 1968 of the 1967 Dangerous Drugs Act, it has been illegal for any doctors except those working in drug centres to prescribe heroin. With the consequent introduction of the methadone maintenance clinics there has been a definite change in the overall pattern of addiction, largely governed by drug availability. It is difficult to estimate the extent of dependence on, or misuse of, barbiturates, but it is likely that the figure for the United Kingdom may be in the order of 150 to 250 per 100,000 (Bewley, 1970). In a recent study of sedative abuse, Mitcheson *et al.* (1970) found that 95 per cent of the heroin addicts interviewed had used sedatives.

Addicts who cannot get heroin or methadone may use more barbiturates and become drunkenly aggressive, with drug-induced fast activity in the electroencephalograph.

Study of the possible relationship between behaviour and barbiturates abuse is commonly very difficult, as in order to avoid having his maintenance methadone reduced the addict frequently denies taking barbiturates. Urine tests are only of limited value, the patient either refusing or being too stuporose to micturate, or false positives or negatives are obtained.

The present prospective study was made in order to clarify the value of the electroencephalograph in diagnosing barbiturate intoxication.

### METHOD

Social and family histories were taken from fifteen young addicts aged between 21 and 24 attending a maintenance methadone clinic. Each had a history of at least four years methadone addiction.

At the time the electroencephalographic recording was made each patient was asked whether he had ever taken barbiturates, and if so whether this was within one month of the recording. A urine sample was also taken and sent for assessment of its barbiturate content. The electroencephalographs were standard bipolar recordings using electrodes placed according to the usual Maudsley system. There was a recording time of approximately 30 minutes, followed by 3 minutes of hyperventilation and a period of photic stimulation. Following visual assessment the records were divided into three categories according to the persistence of fast, i.e. 15-30 c/s, activity of more than 20 microvolts amplitude. These were:

- A: Present 75 per cent or more of the time;
- B: Present 25-75 per cent of the time;
- C: Present less than 25 per cent of the time.

### RESULTS

Five of the fifteen addicts admitted to taking barbiturates at the time of the electroencephalograph being recorded (Group I). Of these, four showed barbiturates present in their urines and one did not. All five showed a significant change in behaviour, having records of aggression and police involvement. One died as a result of barbiturate poisoning at a later date. In each case there was either category A or B fast activity in the record.

Ten of the remaining addicts denied taking barbiturates, and in two of these their urines were positive for barbiturate content (Group II). The electroencephalograph records of five of the patients in this group showed category C of fast activity. Of these, three had no history of aggression or police involvement either before or after becoming addicted to drugs; while the

remaining two addicts had a record of antisocial behaviour before and during addiction.

Of the further five patients in Group II, two were found to have barbiturate in their urines and Category A fast activity in the electroencephalograph. Both had become aggressive since addiction, and one later died of an overdose of barbiturates. The remaining three patients had negative urines, two had category B fast activity in the electroencephalograph and one had category A. All five had a history of antisocial behaviour and one (showing B activity) had on occasions clinical signs indicative of possible barbiturate misuse: abscesses, ataxia and slurred speech. The second addict showing B activity had barbiturates in his possession when at a later date he was searched by the police.

#### DISCUSSION

Since they are cheap and relatively easy to obtain, the abuse of barbiturates has become an increasing problem. A recent study among heroin addicts showed that 95 per cent were barbiturate abusers (Lynch, 1971). In addition to painful abscesses at the injection site and severe withdrawal fits, perhaps the most dangerous effect is the accompanying mood change in which the addict may become aggressive or overdose himself either accidentally or as a result of depression.

In an era of multiple drug abuse it is important to gauge the prevalence of barbiturate injection. The development of antisocial behaviour in these patients showed a definite relation to increased barbiturate usage.

It has been known for many years that barbiturates lead to an increase in the rhythmic fast components of cortical electrical activity

(Brazier and Finesinger, 1945), and it was therefore not unexpected to find a greater amount of such activity in the EEG's of those patients who admitted taking barbiturates than in those who denied it and had negative urines. On the ten addicts who denied barbiturates, five showed either A or B activity. As previously indicated, three of these had significant clinical or social histories to warrant doubt of their denial.

#### SUMMARY

It is suggested that in view of the unreliability of urine testing the electroencephalograph can be of value in assessing those addicts who deny taking barbiturates and yet show clinical signs of possible barbiturate intoxication or who have a recent history of violence or behaviour change. If the electroencephalograph shows little fast activity the denial may perhaps be believed, but if fast activity is prominent one should be very sceptical in accepting the addict's denial of barbiturate usage.

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## The Gestation Period of Identity Change

By JAMES MATHERS

The object of this paper is to consider the proposition that some kinds of critical change in a person's life experience bring about a change in his sense of identity which is not subjectively recognized and acknowledged until between one and two years after the critical event or initiation of the critical change.

I first formed this impression when as an army psychiatrist I was interviewing expatriate soldiers in India in 1943. Those whose complaints appeared to be mainly referable to a failure to adapt to the stress of expatriation had usually left the United Kingdom between 12 and 15 months before their low morale had led to clinical referral. At some time during the second year of expatriation it seemed that there was a change in many men's subjective response to mail from home, linked with a memory change. Whereas in the first year letters were valued for their detailed content, and gossip about the neighbours and acquaintances provoked the same kind of interest as it would have at home, there came a point when this interest in casual detail faded, while letters themselves became more intensely valued as symbols that loved ones still cared. At about the same time interval, I noticed that soldiers' accounts of their home circumstances tended to become idealized: for example, a man whose home was in fact a poverty-ridden slum marred by parental strife would give an account of an arcadian cottage inhabited by a serene old couple who had no greater interest in life than to await his return. It was of course only rarely that this kind of discrepancy could be confirmed by external evidence. At the time I regarded this as an example of the Gestalt principle of 'closure' applied to memories, but did not appreciate the possible significance of the time interval of 12 to 18 months.

At the end of the war, particular efforts were made by the authorities to find suitable employment for ex-servicemen (especially ex-prisoners of war) whose jobs had disappeared during hostilities. In the first few post-war years I was

surprised to meet with a number of men who had apparently been satisfactorily 'resettled' with help from the authorities, but who after about 18 months had given up quite good occupational prospects and sought fresh jobs of their own choosing. It seemed that subjectively, even when the experience of resettlement went smoothly, this amount of time had to elapse before some men had regained enough self-confidence to reassert their autonomy as individuals.

During the last eight years I have been attending weekly psychodynamically-oriented group sessions with students taking one-year courses, some in pastoral studies and some in residential child care. In both settings one has the impression that at the end of a year many students are still in the process of struggling with the novelty of an altered perception of themselves and feel dissatisfied; but among those one meets a year or more later it seems as if the psychodynamic experience has been emotionally digested and, in retrospect, realistically valued.

An even more idiosyncratic observation may be made. Having retired after 12 years as a mental hospital superintendent in June 1971, it was not until February 1973 that a casual recollection of this item of personal history struck me with astonishment: 'how on earth did I ever come to be playing a role which (now) seems so foreign to me?' I take this to mean that my sense of personal identity has altered, in a decisive if unspecifiable way, in something not greatly less than the 20-month interval.

These personal impressions have lately been reinforced by evidence from other sources. In one of his papers Parkes (1970) reviews the symptoms of grief which occur particularly in the first twelve months after bereavement, and then goes on to say 'Among widows whom I talked to, most seemed to feel that the watershed occurs round about the second year of bereavement. By the end of the second year, they're on course. At the end of the first year, they're past



the peak of their grieving, but they still haven't found a new course.' In other words, a widow tends to accept her changed sense of identity only after a lapse of appreciably more than twelve months.

The evidence points in a similar direction in the case of offenders. Follow-up studies now in progress of patients in a psychiatric prison are beginning to suggest that (measured by rates of reconviction within two years) the optimum length of stay in the institution is not less than 13 to 15 months and not more than 3 years (Jillett, 1973).

There are other indications which suggest the possible importance of the 1 to 2 year interval. The typical degree course at a university, which might be described as enabling an identity-change from 'late adolescent' to 'professional man' for many students, lasts three years. It seems to be widely recognized that it is during the first two terms of the second year of such a course that students show most evidence of subjective discomfort and dissatisfaction with themselves. If indeed the first 18 months of this kind of experience is taken up mainly with achieving and consolidating a personality change, then the third year of the degree course may be required for the learning-in-context of the technical equipment proper to the holder of the degree. This interpretation suggests that the first four terms of a university course might be more appropriately structured to enable the desired personality reorientation to occur, allowing elements of technical indoctrination to play only a secondary part in the curriculum.

Medical men coming to Britain for post-graduate study from non-Western countries tend to be reluctant to return to their home countries (which often can ill spare them), if they stay here more than a certain length of time. I know of no published study showing how long this time is, but have the impression from talking with postgraduate teachers that it is something under two years.

In the industrial field, the promotion of a young married man in a big organization may mean his uprooting home and family as well as taking on unfamiliar responsibilities at the same time. Senior executives are only slowly becoming aware, through bitter experience, of the

bad effect on health and stability this sudden change can sometimes have on the man and his family during his first year. If it were recognized that most men need about 18 months to become familiar with their new identities, industry might be able to temper the demands it makes on such men to accept heavy responsibilities immediately after transfer.

The achievement of a new sense of identity following a critical change in life circumstances is, of course, a sign of health and growing maturity, not of pathology or illness. In the field of pathology it is profitable to search for a particular cause which may account for multiple effects, but in the field of healthy development the reverse seems to be true: that a particular achievement (in this case an adaptive personality change) can only result from a multiplicity of antecedent 'causes'; and prediction is impossible in practice because of the excessive number of variables which would have to be taken into account. And if indeed there is 18 months delay between the crisis experience and its final resolution, shorter-acting variables arising during this 18-month period may also bear on the outcome and complicate the aetiology still further. Experimental verification of the hypothesis would thus seem very difficult. In any case, a man's sense of identity, though crucial to his effective functioning, is a matter of inner experience with no easily definable objective signs. But even if the hypothesis remains unverifiable (or unfalsifiable) as a cause-and-effect sequence it may still be a useful interpretation if it leads to more effective action. One possible consequence would be to suggest a need for longer term follow-up of people exposed to crises when these are known to disturb a man's sense of identity. The follow-up period of the series reported by Parkes (1972) is limited to 14 months, for instance (since he is mainly concerned with the bereavement experience as a cause of ill-health rather than as a life crisis which can lead to greater emotional health and maturity). Another consequence might be that young professionals from the 'third world' coming to this country for post-graduate study should be encouraged to stay for no longer than a year at a time.

Caplan (1964) elaborated a theory of crisis

experience which emphasized the organism's tendency to regain homeostasis, either in a healthy or pathological direction, within a fairly short period of time. The more obvious kinds of behaviour disturbance often seem to settle within a few weeks; but there is a good deal of evidence (e.g. from the bereavement studies) that some degree of psychosomatic disturbance commonly persists for about 12 months. So it is logical to expect that evidence of complete resolution of the disturbance would not be manifest until some time in the second year.

What is not clear from any of the evidence presented here is the relative importance, in determining the final outcome, of the initial 'shock' period of the crisis (which can be postulated as lasting not more than 12 weeks), as compared with the total 18-months' exposure to a new psychological environment. In the case of bereavement, expatriation, promotion at work, or admission to a psychiatric prison, the change which initiates the process continues throughout the period. But in psychotherapeutic situations significant personality change sometimes occurs as a result of a relatively sudden flash of new insight or understanding of oneself. The question then arises as to whether or not the important activity in psychotherapy is the establishment of rapport and the sowing of a seed of new insight, which is likely to occur in the first 12 weeks and is similar to Caplan's concept of 'crisis intervention'; while the healthy outcome of this change in the client's way of viewing himself is not accessible to assessment until about 18 months later. (It is not necessary that the client should consciously acknowledge his new insight: an unwelcome interpretation may be consciously resisted but may still be effective.) If this is so, it suggests that the therapist's relationship with his client, necessarily exploratory and intense in the initial stages, could be continued at a less intense and more simply supportive level for some months thereafter. To use a biological analogy: insemination and conception has to be followed by a period of gestation; and, while the success or

failure of insemination remains hidden for a considerable time, prolonged or repeated insemination over the gestation period will not lead to the birth of healthier offspring.

There are two basic attitudes which can be adopted by those in the caring professions to sufferers from emotional disturbance. One is that of the problem-solver, seeking to elucidate cause and effect and to use technical means to interfere with a process which it is feared may lead in an unsatisfactory direction. The other attitude is that of nurturing and sustaining someone who is going through a developmental process which is inevitably stressful, easing only unnecessary pain and offering moral support in a non-specific way, with a minimum of technical interference. If the hypothesis here proposed is accepted, it suggests that the nurturing attitude has a much larger field of relevance than is commonly recognized in the treatment or care of people who are suffering the effects of environmental change; and that at certain stages of treatment it might often be appropriately substituted for a problem-solving attitude which is temporarily irrelevant if not harmful.

#### SUMMARY

Observations and arguments are adduced for the hypothesis that critical experiences which initiate change in a man's sense of identity are not usually emotionally digested until about 18 months have elapsed. If accepted, the hypothesis has significant implications for those programmes in education and therapy from which personality change commonly results; and suggests that the effectiveness of such programmes cannot be adequately assessed in less than 18 months from their initiation.

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## A Scale of Disability and Prognosis in Long-Term Mental Illness

By R. MORGAN and J. CHEADLE

Hoening (1967) has recently and comprehensively summarized the extensive literature on the prognosis of schizophrenia. In a section on existing prognostic tests he criticizes the vagueness of the items to be scored, the variety of prognostic criteria and the low validity of the resulting scales. The present paper describes an attempt to devise a new prognostic test, using material which was originally collected in order to study the cost of rehabilitation.

We have described elsewhere (Cheadle and Morgan, 1974) a study of 200 long-stay mentally ill patients. They were selected by R.M. as suitable candidates for rehabilitation. In the process of selection, other candidates had been excluded because of disabilities which appeared to make their prospects hopeless and which were not amenable to the regime on offer. These were people subject to unmanageable psychotic episodes, people with character disorders who were always difficult to manage, and people with severe physical disabilities in addition to their mental illness. The chosen 200 were transferred in 1961-2 from eleven other mental hospitals in the Birmingham Region to St. Wulstan's Hospital (Morgan, Cushing and Manton, 1965) for rehabilitation. In the previous study their careers from 1961 to 1970 were recorded and the net cost of the care and treatment of each individual was calculated. This net cost was obtained by adding together everything that an individual had cost the national economy and subtracting from that all direct financial contributions that he or she had made during the ten-year period. Information about the sample and the method of study is contained in the previous paper.

Our purpose now is to use these individual

costings as the basis for studying the prognosis of the long-stay patient. For this purpose we had first to discard 16 of the 200 patients because they did not complete the full ten years in this country; one patient had been repatriated to Sierra Leone and 15 had died by the end of 1970.

The remaining 184 patients form our sample. We have converted each patient's net cost figure into a Cost Index according to the formula:

Cost Index =

Individual net cost  $\times$  100

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Mean parent hospital maintenance cost for 1961-70

In their raw form the Cost Indices ranged from 7 to 170 and were not normally distributed. For statistical purposes they have therefore been T-scaled (McCall, 1939), with a mean at 100 and a standard deviation of 20. These T-scaled Cost Indices provide our measure of the performance of each patient during ten years.

We have also assembled for each patient all the relevant data that were available within a week of the date of transfer in 1961-2. These were obtained: (a) from the previous hospital's records; (b) from the results of an interview with one of us (R.M.) before transfer, using the standard procedure described by Wing (1961); (c) from information provided by the patient's Ward Sister or Charge Nurse in the previous hospital before transfer, using Wing's (1961) behaviour scales, and (d) information about the patient's I.Q. (W.A.I.S.) and work performance, using the form described by Cheadle *et al.* (1967).

Although Wing's clinical groups and behaviour scales were designed to classify schizophrenic patients only, we have used them with his permission to classify all the patients in our sample, 11 per cent of whom were not schizophrenic.

The data listed in the previous paragraph provide information from several points of view about the state of each patient at the beginning of his or her course of rehabilitation. Our method of study is to link this original information with the individual Cost Indices which are our measure of subsequent performance, in the expectation that certain variables will turn out to be useful predictors of outcome.

For a preliminary survey, we split the patient sample into those whose cost indices were above the mean and those below, and tested them against the available admission data. Since some of the admission data were in the form of nominal scales and others were in ordinal or interval scales, we had to use the contingency coefficient (*c*) to compare their predictive ability. For this purpose each variable had to be grouped in the same sized table, and we found that the  $4 \times 2$  size fitted the data best. This procedure gives a fair comparison of the predictive ability of the variables at the price of losing some information from those with interval scales. In order of predictive ability the results were as follows:

Our next step was an attempt to combine the more promising of these variables into some kind of scale. We tried numerous combinations and weightings of different numbers of variables. The highest predictive validity was found to be obtained from the use of only three variables arranged in a four-point scale.

|                         | Score |       |         |         |
|-------------------------|-------|-------|---------|---------|
|                         | 0     | 1     | 2       | 3       |
| Wing group              | 1B    | 1A    | 1C, 2   | 3, 4, 5 |
| Social withdrawal score | 0     | 1, 2  | 3, 4, 5 | 6+      |
| Work score              | 0-15  | 16-31 | 32-47   | 48-64   |

The weighting was done as follows: For each variable we calculated the proportion of patients who cost below the mean cost index in each sub-group of that variable. These were found to fall into four clusters and it was for this reason that we decided to use a four-point scale. Sub-groups placed in the 0 column of the final scale have more than 64 per cent of their patients costing less than the mean cost index; i.e. Wing Group 1B, those scoring 0 for social withdrawal and those scoring 0-15 for work. Sub-groups placed in the 1 column have

| Variable                                                                                       | Chi-square | p      | Contingency coefficient |
|------------------------------------------------------------------------------------------------|------------|--------|-------------------------|
| Length of stay in parent hospital .. .. .                                                      | 4.89       | N.S.   | 0.160                   |
| Attitude to discharge .. .. .                                                                  | 7.07       | N.S.   | 0.192                   |
| Age on first admission to mental hospital .. .. .                                              | 7.16       | N.S.   | 0.193                   |
| Age on transfer to rehabilitation hospital (the oldest did best) ..                            | 8.51       | <0.05  | 0.209                   |
| Knowledge of current events .. .. .                                                            | 10.28      | <0.05  | 0.228                   |
| Socially embarrassing behaviour .. .. .                                                        | 13.82      | <0.01  | 0.264                   |
| Work in parent hospital (individual workers in wards or hospital departments did best) .. .. . | 14.01      | <0.01  | 0.265                   |
| Best previous occupation (semi-skilled did best) .. .. .                                       | 13.11      | <0.01  | 0.267                   |
| I.Q. (those between 85 and 104 did better than higher or lower) ..                             | 14.80      | <0.01  | 0.282                   |
| Wing group .. .. .                                                                             | 20.92      | <0.001 | 0.318                   |
| Social withdrawal .. .. .                                                                      | 26.57      | <0.001 | 0.353                   |
| First work performance score after transfer .. .. .                                            | 40.50      | <0.001 | 0.424                   |

There was no association between diagnosis and outcome.

47-64 per cent below the mean cost index, those in the 2 column 26-46 per cent and those in the 3 column less than 26 per cent.

This procedure gives the scale a pattern which is logical in every respect except one. Our patients in Wing Group 1B did distinctly better than those in Group 1A, which is why they have been placed higher in the Scale. Group 1A patients are free from clinical symptoms according to Wing's definition, yet the ones in our sample had become long-stay patients, and we can account for this and their limited performance only by supposing that they had more severe non-clinical handicaps than the Group 1B patients. Diagnosis does not account for the anomaly. Eleven of the 43 patients (26 per cent) in Group 1A were not schizophrenic, compared with 14 of the 70 patients (20 per cent) in Group 1B. This difference is not significant ( $\chi^2 = 0.212$ ).

The scale is used by rating a patient on each of the three variables, circling the rating in the appropriate column of the scale and adding the scores set out at the head of the respective columns. For example a patient in Wing Group 5 with a Social Withdrawal score of 8 and a Work score of 50 scores 3 points for each making a total of 9.

It will be noted that this scale is composed of items contributed by the three principal figures in the long-stay patient's treatment, namely the doctor, the nurse and the work supervisor.

Having devised this scale, we proceeded to calculate Prognosis Scores for each of the 184 patients. Since we had no independent sample on which to test our predictive tool, we split the available sample into two halves depending on whether their hospital registration number was odd or even. The Prognosis Scores were then correlated with Cost Indices. For the odd-number sample  $r = 0.620$ , for the even-number sample  $r = 0.495$ , and for the total sample  $r = 0.560$ , all of which are highly significant ( $p < 0.001$ ). These were considerably higher correlations than we obtained with any of the many other combinations of variables that we tested. The use of three variables also gave a better prediction than was obtained from using on its own the best single predictor, namely the Work Performance Score.

|                        | r     | Contingency coefficient |
|------------------------|-------|-------------------------|
| Prognosis Score        | 0.560 | 0.436                   |
| Work Performance Score | 0.530 | 0.424                   |

Admittedly there is not a great deal of difference. Indeed, we think it is remarkable that one week's assessment of work performance alone, regardless of other variables, should have turned out to account for as much as 28 per cent of the variance in the ten-year outcome. The balance is presumably accounted for by differential response to the rehabilitation process and by the influence of other variables. Although work performance alone has been shown to yield such a surprisingly good prediction of outcome, we suggest that it is worthwhile and wise to improve upon this by including the other two variables our more elaborate scale contains. After all, the patients' clinical state and behaviour are matters that nobody would ignore, and there is much to be said anyway for rating them in the standard well-validated way Wing has devised.

We have also investigated the association between the Prognosis Score and the proportion of patients who achieved discharge and the length of time they took to do so. For prognostic or planning purposes, the following analysis of the performance of our 184 patients may be of use. We include in it the distribution of Prognosis Scores.

| Prognosis scores | Number of patients | Percentages of patients who were living successfully outside hospital on various anniversaries of their date of admission |         |         |
|------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------|---------|---------|
|                  |                    | 2 years                                                                                                                   | 4 years | 8 years |
| 0                | 21                 | 67                                                                                                                        | 90      | 86      |
| 1                | 25                 | 36                                                                                                                        | 60      | 60      |
| 2                | 32                 | 47                                                                                                                        | 56      | 59      |
| 3                | 27                 | 37                                                                                                                        | 52      | 52      |
| 4                | 25                 | 8                                                                                                                         | 44      | 52      |
| 5                | 11                 | 9                                                                                                                         | 9       | 36      |
| 6                | 22                 | 5                                                                                                                         | 18      | 27      |
| 7                | 14                 | 0                                                                                                                         | 0       | 21      |
| 8                | 2                  | 0                                                                                                                         | 0       | 0       |
| 9                | 5                  | 0                                                                                                                         | 0       | 0       |

The criterion for inclusion in this table was 'living successfully outside hospital'. About 15 per cent of the patients included in the Table were attending hospital for sheltered work. If there had been a Day Centre, they could equally well have attended that. The remaining 85 per cent of the patients were no longer dependent on hospital for anything except an occasional out-patient visit, and nearly all of them were in open employment.

From this table some conclusions may be drawn about the predictable response of long-stay patients to a newly-introduced regime of intensive rehabilitation. Almost all patients with a Prognosis Score of 0 can be resettled successfully in time. Patients with scores of 1-4 do less well, but more than half of them can be resettled. Only about a third of those patients scoring 5-6 are likely to be able to lead an independent life. According to this hospital's treatment results, those patients with a score of 7-9 are so severely disabled that they will continue to need the shelter either of a hospital or of its equivalent under some other name.

#### SUMMARY

One hundred and eighty-four long-stay mentally ill patients have been studied over the ten years 1961-70, during which they were exposed to an active rehabilitation regime. The total net cost to the State of maintaining each individual during this period has been taken as an index of individual performance under this regime and subsequently. All relevant nosological data that were available about

each patient at the start of the rehabilitation process have been tested for their value as predictors of the long-term outcome. The best prediction was furnished by three items, Wing Group, Social Withdrawal Score and Work Performance Score. The three items have been put together into a scale, and the kind of information this yields has been specified. The scale may prove useful for various purposes, such as making prognoses, quantifying and communicating degrees of disability, predicting the case-load on scarce and expensive rehabilitation facilities, and making the best use of these by improving the accuracy with which appropriate patients are selected for them.

#### ACKNOWLEDGEMENTS

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# Evaluation of Ward Group Meetings in a Psychiatric Unit of a General Hospital

By JASON MARATOS and MARGARET J. KENNEDY

## INTRODUCTION

Since the beginning of the century, group methods have played an increasingly important role in the treatment of patients suffering from psychological or physical disorders.

Although group methods had been used long before the Second World War, it was during that period that they matured as therapeutic tools.

Most of the published work in this field reports effects of group psychotherapy (Stein, 1971), or of therapeutic community methods as a whole, with few attempts to evaluate the effect of ward meetings *per se*, or to support their observations with objective evidence (Abramczuk, 1966; Woods, 1970).

The aim of the present study was to measure the effect of ward group meetings held in a psychiatric unit of a general hospital. The hypothesis was that a measurable improvement in patients' behaviour would result.

## METHOD

### *Description of wards, patients, and staff*

Two of the four mixed open psychiatric wards in a general hospital in central London were involved in the study. Each had twelve female and eight male beds.

Patients on both wards were adults of mixed diagnoses. Their socio-economic background was similar, as the wards drew their patients from adjacent catchment areas in the same London borough. The majority of patients were admitted by the Senior House Officers, who admitted patients to the various wards according to the area in which they resided.

Turnover of patients in the two wards differed. As shown in Table I, there were significant differences in the number of admissions and female admissions over the period.

TABLE I  
*Number of admissions during present study*

| Ward        | Male | Female  | All admissions |
|-------------|------|---------|----------------|
| A ..        | 29   | 58      | 87             |
| B ..        | 26   | 27      | 53             |
| $\chi^2$ .. | .16  | 11.30** | 8.26*          |

d.f. = 1 for all comparisons.

\*  $p < .01$ ; \*\*  $p < .001$ .

Each was under the overall supervision of a consultant psychiatrist, each with similar training background. One Senior House Officer was attached to each ward for approximately half his stay in the unit, and then changed to another ward. This changeover fell between weeks 13 and 14 of the study, the investigator concerned (J.M.) moving from Ward A to Ward B.

During this period, there were no major changes in nursing staff.

### *Description of meetings*

Hour-long meetings were held weekly at mid-day, when both shifts of nurses could be present. All in-patients and day patients and all staff on duty were asked to attend. Participation was not compulsory, but the nurses encouraged patients to attend. None of the participating staff was a trained psychotherapist, and there was no supervision by a psychotherapist. There was no set agenda, and no attempt by the staff to select topics. The meetings were not intended as formal psychotherapy, and the patients were discouraged from discussing individual personal problems if they were thought to be of no interest to the group as a whole; e.g. delusional material. On the other hand, discussion which might be helpful to

others was encouraged; e.g. fears about the side effects of ECT.

Staff meetings were also held weekly to discuss the ward meeting and inter-staff and staff-patient problems.

#### *Plan of the study*

The study lasted for 22 weeks. During weeks 1 to 9, meetings were held in Ward A only. During weeks 10 to 13, no meetings were held in either ward. During weeks 14 to 22, meetings were held in Ward B only. In this way, each ward served as a control for itself and for the other ward.

#### *Evaluation measures*

*Ward incidents.* An 'incident' was defined operationally as any event in the ward considered sufficiently out of the ordinary by the nursing staff to be entered on their records.

*Ward Atmosphere Scale.* The Ward Atmosphere Scale represented an attempt to quantify the impression received on entering the ward by a person familiar with the patients and staff. It includes estimates of noise and movement levels, socialization, complaining and hostile behaviour, and the reaction of staff and patients to the rater.

The scale was completed at random intervals throughout the 22 weeks of the study, approximately once a week, by one of the investigators (M.J.K.).

*Attitude Scale.* The Attitude Scale was devised to elicit feelings about ward meetings, including the subject's opinions on whether ward meetings are helpful or harmful to patients or to staff; whether they improve or worsen relationships between and among patients and staff; and whether they improve or worsen patients' behaviour. It was administered before and after the experimental period to both patients and staff.

### RESULTS

#### *Content of meetings*

At the ward meetings, the level of discussion varied from superficial topics, such as the washing-up rota, to more significant ones, such as social attitudes toward mental illness, problems of friendship and loneliness, and others

relevant to ward life itself, including authoritarianism of staff and sharing the space with acutely disturbed or violent patients.

At staff meetings, members explored inter-staff problems and staff-patient relationships, and attempted to clarify motives underlying patient and staff behaviour and the patterns of group behaviour, at a different level from that of the ward meeting. For example, the topic 'side effects of drugs' was discussed in a factual way at the ward meeting, but in the staff meeting the possibility that the topic might represent repressed hostility towards staff was explored.

#### *Ward incidents*

In both wards, the holding of meetings was associated with a significant reduction in the number of incidents recorded, as shown in Table II.

Although fewer patients were involved in causing incidents under the experimental conditions on both wards, the differences were not statistically significant, as shown in Table III.

Table IV gives a summary of the main types of incidents recorded, and their frequency. The greatest changes were in the number of times

TABLE II  
*Number of ward incidents*

| Ward |    | Condition |            | $\chi^2$ |
|------|----|-----------|------------|----------|
|      |    | Meeting   | No meeting |          |
| A    | .. | 48        | 81         | 7.94*    |
| B    | .. | 29        | 49         | 4.62*    |
| Both | .. | 77        | 130        | 13.06**  |

d.f. = 1 for all comparisons.

\*  $p < .005$ ; \*\*  $p < .0005$ .

TABLE III  
*Number of patients causing incidents*

| Ward |    | Condition |             | $\chi^2$ |
|------|----|-----------|-------------|----------|
|      |    | Meetings  | No meetings |          |
| A    | .. | 14        | 17          | .29      |
| B    | .. | 9         | 11          | .20      |
| Both | .. | 23        | 28          | .49      |

d.f. = 1; n.s.



TABLE IV  
*Incidents, by type, both wards combined*

| Type of incident                  | Condition |              | d. |
|-----------------------------------|-----------|--------------|----|
|                                   | Meet-ings | No meet-ings |    |
| Absconding from ward ..           | 21        | 48           | 27 |
| Refusing medication ..            | 10        | 23           | 13 |
| Breaking objects ..               | 3         | 8            | 5  |
| Attacking staff ..                | 3         | 5            | 2  |
| Requiring emergency medication .. | 16        | 18           | 2  |
| Attacking other patients ..       | 6         | 5            | -1 |
| Harming self ..                   | 7         | 5            | -2 |
| Other ..                          | 11        | 18           | 7  |

patients refused medicine or absconded from the ward, but changes occurred also in most of the other categories.

'Other' incidents were mainly physical complaints, real or imagined, which necessitated calling the duty doctor. Changes in the opposite direction in two of the categories were too small to be statistically significant.

#### *Ward Atmosphere Scale*

Scores on the WAS were remarkably stable over meeting and no-meeting conditions, with mean scores of 4.38 and 4.4 respectively. Analysis of variance showed no significant difference between treatments ( $F = 10.138$ , d.f. = 2, n.s.) or between wards ( $F = .215$ , d.f. = 1, n.s.).

#### *Attitude Scale*

Analysis of Attitude Scale scores showed no changes in patients' attitude towards ward meetings.

Staff attitudes changed in a negative direction on Ward A, and remained positive on Ward B, as shown in Table V.

TABLE V  
*Staff attitudes before and after meetings*

| Ward | Attitude     | Before meetings | After meetings |
|------|--------------|-----------------|----------------|
| A .. | Favourable   | 5               | 0              |
|      | Unfavourable | 2               | 2              |
| B .. | Favourable   | 6               | 7              |
|      | Unfavourable | 2               | 1              |

#### *Admission and discharge rates*

Turnover rates were not influenced by experimental conditions.

#### DISCUSSION

The most objective measurement of patient behaviour, the number of incidents recorded, was the only one to show significant changes in the expected direction. The types of incident most affected (refusing medication and absconding from the ward) can be interpreted as expressions of hostility to staff, and the change suggests that such feelings can be expressed verbally instead when given an outlet such as a relatively unstructured meeting.

The fact that the number of incidents returned to its original level as soon as meetings stopped indicates that this effect is not a long-term one. It also suggests that the effect on the patients is direct, and not due to resultant changes in staff techniques.

As the Ward Atmosphere Scale is an unstandardized instrument, it is not possible to say whether the results mean that it is not sufficiently sensitive to changes in behaviour, or whether ward behaviour as a whole was indeed unchanged by the experimental conditions. The reliability of the scale could be questioned on the grounds that the scoring is largely subjective, and that the rater knew which of the wards was currently holding meetings.

The Attitude Scale proved to be difficult for patients to complete, as most of them had never considered ward meetings, did not know what they were, and really had no opinion to express. Because of the high patient turnover it was not possible to measure pre- and post-meeting opinions of the same patients.

The scale appeared more useful in reflecting the attitude of staff to ward meetings. It is interesting to note that the unfavourable attitude of staff on one of the wards seemed to have no effect on the relationship between meetings and incidents. This suggests that the effectiveness of ward meetings is not dependent on enthusiastic co-operation of the majority of the staff.

The study would have to be replicated in different settings to determine whether the

findings have general application. This is partly because both the parameters of the meetings and the measurement of their effectiveness include soft data liable to subjective interpretation.

#### CONCLUSION

The data collected in this study give some support to the hypothesis that patients' behaviour in a ward improves if they are given a chance to participate in a series of unstructured, permissive meetings, and to express their feelings about other patients and staff verbally without having to resort to acting-out behaviour.

The effect on the patients appeared to be a direct one, and not *via* better management by the staff. Previous training in psychotherapy, supervision by a psychotherapist, or positive attitude of staff towards ward meetings do not appear to be necessary to achieve this effect.

#### SUMMARY

Two psychiatric wards in a general hospital were used alternately as subject and control group, each taking part for a nine-week period in weekly ward and staff meetings. The effect on patients' behaviour was assessed by comparing the number of disruptive incidents recorded in the nurses' notes, and by scores on

two rating scales. The former measure showed significant differences in patients' behaviour, particularly in a reduction of the number of times medication was refused and the number of abscondings on both wards during the periods in which meetings were held.

This was interpreted as suggesting that ward meetings, in providing an opportunity for verbal expression of hostility, prevent some of the non-verbal acting out of these feelings.

#### ACKNOWLEDGEMENTS

This study was carried out at Hackney Hospital, where one of the authors (J.M.) was S.H.O. and the other (M.J.K.) Senior Psychologist.

Thanks are due to Dr. Trevor Silverstone, who suggested that we should undertake this study, and who encouraged us in all stages of our work; to Dr. J. L. Reed for his permission to hold (and withhold) meetings on his ward; and to the nursing staff and patients of the Psychiatric Unit for their co-operation, and for putting up with the stress that these changes must have caused them.

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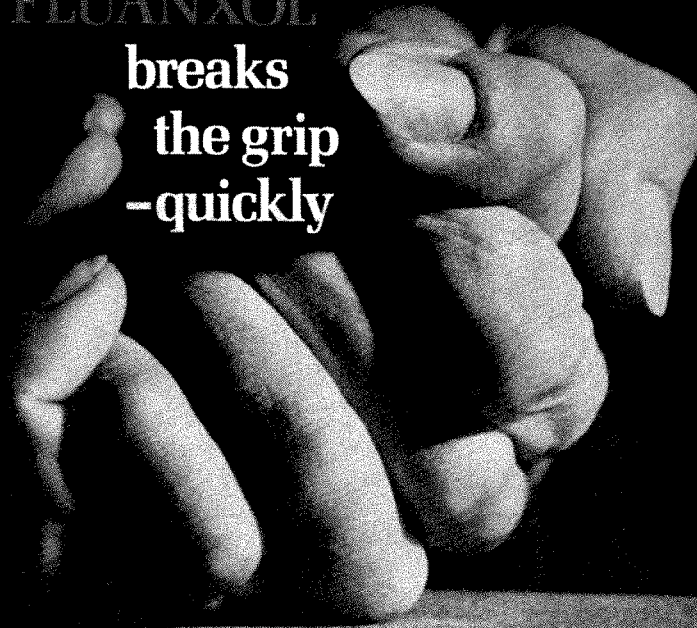
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5. *Ibid.* (1973), 122, 566.
6. *Curr. Med. Res. and Opin.* (1974), 2, 79-89. Each Fluanxol tablet contains 0.5 mg. flupenthixol as the dihydrochloride. Full information is available on request.

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## Acute Toxic Psychosis in Two Children Treated with Benzhexol Hydrochloride (Artane)

By DORA BLACK and SUSAN WOOLLACOTT

Although there have been reports of psychotic reactions to benzhexol hydrochloride in adults we have not found any reports of adverse reactions in children. Recently, at the in-patient psychiatric unit of the Hospital for Sick Children, Great Ormond Street, London, we have seen two children who developed acute psychotic reactions when treated with benzhexol hydrochloride given to prevent extra-pyramidal side effects. In both cases, complete recovery occurred rapidly when benzhexol was discontinued.

### CASE REPORTS

#### *Case 1*

Anne, aged 13, a girl of average intelligence (IQ = 91) was admitted with anorexia nervosa. She commenced chlorpromazine 25 mg. t.d.s. to control her overactivity. Over the next 11 days the dose was increased to 75 mg. t.d.s., at which point benzhexol hydrochloride 5 mg. t.d.s. was added. After the second dose of benzhexol she became confused, disorientated, restless, and agitated and both visually and aurally hallucinated. A toxic confusional state was diagnosed and both drugs were stopped. Anne gradually returned to normal over the next 12 hours, but remained amnesic for the episode.

#### *Case 2*

Robina, aged 3½ years, is a hyperactive twin of dull average intelligence. She was given haloperidol 0.1 mg. b.d. and benzhexol hydrochloride 2 mg. b.d. as a day patient to control her hyperkinesia. Her mother reported the onset after the first dose of acute excitement, sleeplessness and apparent visual hallucinations, which ceased when both drugs were discontinued.

She was then admitted to the Psychiatric In-Patient Unit and two days later began haloperidol 0.1 mg. b.d.; after three days it was increased to 0.2 mg. b.d. and benzhexol hydrochloride 2 mg. was added. Robina became irritated, vague and very

sleepy within an hour of the first dose. Her speech was slurred and incoherent and later that night she awoke crying noisily (unusually for her) and appeared not in touch with her surroundings. This time the benzhexol hydrochloride was stopped and the haloperidol continued. The symptoms rapidly cleared and orphenadrine hydrochloride was introduced with no adverse effects.

### DISCUSSION

Adverse reactions to benzhexol hydrochloride are rare in psychiatric practice, although an incidence of up to 4 per cent can occur in treating elderly patients who have Parkinson's disease (Stephens, 1967). They also occur when massive doses are taken with suicidal intent (Ananth *et al.*, 1970). The incidence in children is not known. The youngest patient recorded in the literature to date was 18 years of age (Warnes, 1967). It has been thought that young people are unlikely to develop such reactions, and indeed Stephens suggests that the reason for the rarity of adverse reactions to benzhexol hydrochloride in schizophrenics may be that they are a predominantly youthful group. The hallucinogenic properties of benzhexol hydrochloride have been known for some years, and have been abused by adolescent drug takers (Bachrich, 1964). Stephens (1967), Warnes (1967) and Ananth *et al.* (1970) all report visual hallucinations and toxic confusion in adult patients. The mechanism of the toxic psychosis is not known, but Stephens (1967) suggests its action is similar to other sympathomimetic drugs such as amphetamine, which excite the hypothalamic and reticular-activating systems, whilst suppressing cortical functions. The reaction appears reversible when the drug is discontinued.

It is clear that psychotic reactions to benzhexol are possible in young children. We

considered whether our dosage was too high, but one of Warnes' adult cases had a psychotic reaction with a very small dose (2 mg. t.d.s.) and he thought that the toxic effects were not necessarily dose-related.

# SUMMARY

Two cases of toxic psychosis are reported in young children given benzhexol hydrochloride (Artane) in therapeutic doses.

# ACKNOWLEDGEMENTS

We are grateful to Dr. Philip Graham and Dr. Arnon

Bentovim for permission to report on patients under their care.

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PP1



## Disulfiram Implantation Critically Evaluated

By M. T. MALCOLM, J. S. MADDEN and A. E. WILLIAMS

A previous paper (Malcolm and Madden, 1973) has described the use of disulfiram implantation as a method of treatment for some alcoholics. The results obtained were satisfactory, measured in terms of duration of abstinence and social improvements made in the post-implant period. However, it was suggested that the success of the implant might be due to psychological rather than pharmacological factors. In an effort to clarify the nature of any deterrent effect of the implant, further clinical and biochemical evidence has been collected.

### METHOD

Using the procedure described in the earlier paper 62 patients were given an implant, 21 of whom had more than one, so that results for 91 implants were considered.

A detailed description was obtained of any symptoms experienced by patients on drinking after the implant. The time that had elapsed since the operation was recorded, as was any deterrent effect of such a 'reaction' on subsequent drinking.

In 27 patients whole blood disulfiram levels were measured at various stages after their implant, using the technique of Divatia *et al.* (1952). The method depends upon the ultra-violet absorption of a disulfiram-copper complex. As we had realized in our investigations that interference from other drugs could occur, a qualitative analysis was performed after evaporation of the complex. This was achieved by a new method devised by Porter and Williams (1972), and involved the use of cathode ray polarography. To determine the significance of blood levels given by the implant, checks were made on the levels produced following oral disulfiram therapy. Thus a comparison could be made between the pharmacological activities of the two preparations.

Carbon disulphide ( $\text{CS}_2$ ), which does not occur naturally in the breath and is a breakdown product of disulfiram, has been shown to be exhaled by volunteers receiving oral disulfiram (Merlevede and Casier, 1961). To measure carbon disulphide exhaled by patients treated with oral and implanted disulfiram, Williams (1974) has described a procedure in which the gas is dissolved in diethylamine and its concentration then measured by polarography. Again, these results enabled a comparison to be made between the activity of oral and implanted disulfiram.

When implanted tablets were extruded they were sometimes recovered from the patient and examined. When an implant was repeated, the surgeon looked for the previously implanted tablets if he operated in the same site, and on three occasions a biopsy of tissue from around the previous implant was obtained.

### RESULTS

(a) *Nature of reaction on drinking after implant.* Only three patients described symptoms which could be considered as possible reactions. Of the remaining 59 patients, 55 developed no symptoms when they drank, and 4 others had not resumed drinking when last seen. (These 4 had all remained abstinent for more than a year, so it is unlikely that they will develop a reaction if they drink). The symptoms of the three patients are shown in Table I. None of these 'reactions' was entirely convincing. From the symptoms listed, the first patient in Table I described the most probable reactions, but a week after his last two 'reactions' blood disulfiram levels were below 0.1 mg.%. It is later suggested that levels below 0.1 mg.% are non-therapeutic.

(b) *Effectiveness of implant as a deterrent to drinking.* In only two patients did an apparent reaction cause a reduction in drinking (Table I).

TABLE I

*Symptoms experienced on drinking after implant, and subsequent consumption of alcohol, for the three patients who described a possible reaction to alcohol*

| Patient | Implant | Weeks after implant | Symptoms developed                             | Subsequent consumption |
|---------|---------|---------------------|------------------------------------------------|------------------------|
| 1       | 1st     | 34                  | None                                           | Increased              |
| "       | 2nd     | 17                  | Dyspnoea, palpitations, vomiting, perspiration | Increased              |
| "       | 3rd     | 13                  | None                                           | Increased              |
| "       | 4th     | 26                  | Dyspnoea, palpitations, patchy erythema        | Decreased              |
| "       | "       | 52                  | None                                           | Increased              |
| "       | "       | 65                  | Dyspnoea, palpitations                         | Decreased              |
| "       | "       | 65½                 | Dyspnoea, palpitations                         | Decreased              |
| 2       | 1st     | 22                  | Vomiting, stomach pain                         | Abstained for 21 weeks |
| "       | 2nd     | 43                  | None                                           | Increased              |
| "       | 3rd     | 54                  | None                                           | Increased              |
| 3       | 1st     | 39                  | Nausea                                         | Increased              |
| "       | 2nd     | 8                   | Dyspnoea, palpitations                         | Increased              |

The success achieved by all the other patients, therefore, seems to have been due to an (unjustified) fear of reaction; they were not forced to abstain because of a reaction, they were maintained by the implant's psychological effects.

(c) *Disulfiram blood levels*, Tables II and III. The implanted disulfiram produced a blood level above 0.1 mg.% during the first post-operative week on eight occasions; 7 patients were involved. When these 7 patients' levels at later stages are considered, it appears the results were only transitory, as shown in Table III. The two 'levels' reported at two months and fifteen months are almost certainly false

TABLE II

*Summary of 70 blood disulfiram levels measured at various stages after implant, in 27 patients*

| Weeks after implant | Number of disulfiram levels |                 |
|---------------------|-----------------------------|-----------------|
|                     | Above 0.1 mg. %             | Below 0.1 mg. % |
| 0-1                 | 8                           | 23              |
| 1-4                 | 0                           | 7               |
| 4-26                | 1*                          | 11              |
| 26-83               | 1*                          | 19              |
| Total               |                             | 70              |

\* Believed to be false results due to interference by other drugs; one patient taking 'Sanatogen' and one taking a mixture of preparations including 'Mandrax'.

TABLE III

*Individual records on seven patients (of 27 tested) who had blood disulfiram levels above 0.1 mg.% at any time after implantation*

| Patient | Days after implant | Disulfiram level |
|---------|--------------------|------------------|
| 1       | 1                  | <0.1 mg. %       |
| "       | 2                  | 0.2 mg. %        |
| "       | 3                  | 0.2 mg. %        |
| "       | 7                  | <0.1 mg. %       |
| 2       | 3                  | 0.1 mg. %        |
| "       | 6                  | <0.1 mg. %       |
| "       | 7                  | <0.1 mg. %       |
| 3       | 1                  | 0.1 mg. %        |
| "       | 2                  | <0.1 mg. %       |
| "       | 3                  | <0.1 mg. %       |
| 4       | ½                  | <0.1 mg. %       |
| "       | 1                  | 0.2 mg. %*       |
| "       | 8                  | <0.1 mg. %       |
| 5       | 1                  | <0.1 mg. %       |
| "       | 2                  | 0.2 mg. %        |
| "       | 7                  | <0.1 mg. %       |
| 6       | 2                  | 0.3 mg. %        |
| "       | 9                  | <0.1 mg. %       |
| 7       | 2                  | 0.2 mg. %        |

\* Patient had a CS<sub>2</sub> level of 0.12 mg.M<sup>3</sup> 2 days after implant.

results due to interference caused by the other drugs these patients were taking (see footnote, Table II). These two levels were not qualitatively shown to be caused by disulfiram.

The present authors believe that a blood disulfiram level above 0.1 mg.% is therapeutic. When 51 blood levels were measured on 11 patients treated by oral therapy a level above 0.1 mg.% was invariably obtained. Some of these levels were obtained during a test reaction to alcohol, some followed therapy with a very low dose of disulfiram. For example, one patient who had been given only 0.2 G of disulfiram daily for 14 days had a blood level of 0.83 mg.% 6½ hours after taking her last tablet. The oral preparation always gives a level above 0.1 mg.%, the implanted usually does not.

(d) *Exhaled CS<sub>2</sub> level.* Table IV shows that oral disulfiram therapy produces detectable levels of the gas, but that the implant gave a transient level only once, two days after the operation.

(e) *Examination of rejected tablets,* Table V. About one third of the tablets were dissolved over the first few weeks, though this is no proof that the disulfiram had been absorbed. The absence of tablets at repeated operations suggests that some absorption takes place over a few months. Skin, muscle and connective tissue covering earlier implants were normal in the three cases where biopsies were taken.

#### DISCUSSION

The purpose of oral disulfiram therapy is to cause such an unpleasant reaction to alcohol that the patient will be forced to stop drinking (Williams, 1937; Hald and Jacobsen, 1948; Martensen-Larsen, 1948). In practice the patient will often lose motivation and stop taking his oral therapy. Disulfiram implantation was introduced two decades ago (Marie, 1955) in an effort to overcome 'patient failure'. There have been several reports of its success in Continental series. However, all authors agree that subsequent reactions to alcohol are infrequent. Hryniewicz *et al.* (1966) found that 68 per cent of implanted patients showed no reaction on drinking. Mieniewski (1967) found that only 3 of 340 patients developed 'a typical reaction'. Kellam (1969) found no reaction when he gave his patient 20 c.c. ethanol to drink six months after his third implant. Most authors believe that psychological factors must be important. The present work included the pharmacological evaluation of the implants.

In most series, certainly in ours, patients knew the symptoms of a true reaction, since they had previously experienced this whilst taking oral disulfiram. They also expected the implant to be effective in causing a similar reaction if they drank. In view of this expectancy it is surprising that more patients did not report some symptoms. The symptoms of anxiety

TABLE IV  
*Exhaled carbon disulphide concentrations measured in patients given disulfiram either orally or by implant*

| Patient | Disulfiram given                     | CS <sub>2</sub> level |
|---------|--------------------------------------|-----------------------|
| 1       | 0.2 G orally for 1 day               | 0.1 mg.M3             |
| 2       | 0.4 G orally for 1 week              | 0.4 mg.M3             |
| 3       | 0.4 G orally for 1 week              | 0.4 mg.M3             |
| 4       | 0.4 G orally for 1 week              | 0.2 mg.M3             |
| 5       | 1.0 G implanted ½ day previously     | <0.1 mg.M3            |
| 5       | 1.0 G implanted 2 days previously    | 0.12 mg.M3*           |
| 5       | 1.0 G implanted 8 days previously    | <0.1 mg.M3            |
| 6       | 1.0 G implanted 7 days previously    | <0.1 mg.M3            |
| 7       | 1.0 G implanted 7 weeks previously   | <0.1 mg.M3            |
| 8       | 1.0 G implanted 22 weeks previously  | <0.1 mg.M3            |
| 9       | 1.0 G implanted 28 weeks previously  | <0.1 mg.M3            |
| 10      | 1.0 G implanted 46 weeks previously  | <0.1 mg.M3            |
| 11      | 1.0 G implanted 82 weeks previously  | <0.1 mg.M3            |
| 12      | 0.0 G (control; no disulfiram given) | <0.1 mg.M3            |

\* Blood disulfiram level 0.2 mg.% 2 days after implant.

TABLE V  
Examination of rejected tablets in three cases  
(ten 100 mg. tablets had been implanted)

| Patient | Cause of rejection          | Appearance                                          | Weight                  |
|---------|-----------------------------|-----------------------------------------------------|-------------------------|
| 1       | Infection after three weeks | 8 tablets, pale yellow, smooth, uniformly dissolved | Each 60 mg. $\pm 5$ mg. |
| 2       | Infection after three weeks | 6 tablets, as above                                 | Unweighed               |
| 3       | Rejection after six weeks   | 4 tablets as above                                  | Each 66 mg. $\pm 5$ mg. |

In a further three patients no tablets were found when the operation was repeated in the original site after 12-18 months.

(e.g. palpitations) and of ethanol intake (e.g. flushing of face) naturally occurring when the patient takes his first drink could account for the 'reactions' that were reported.

Whyte and O'Brien (1974), in a controlled trial, have shown significantly better results for the prevention of drinking in an implanted group of alcoholics than in matched controls. Waclawik (1970) claims 'several sham implants . . . gave the same result as the real ones'. The absence of a reaction to alcohol would make a double-blind controlled trial difficult—even if one were ethically prepared to undertake a 'placebo' operation. The 'active' preparation is virtually a placebo.

Our disulfiram blood level studies have not shown the absolutely lowest level of the drug necessary for a reaction, but they have shown that levels above 0.1 mg.% were always obtained even following the lowest dose of oral disulfiram, and that these levels occurred during genuine reactions (following oral therapy). Following implantation, levels above 0.1 mg.% were found infrequently, and were only transitory, occurring during the first few days after operation.

Carbon disulphide studies have been a novel and sensitive way of measuring bio-availability at a ward level. A recent polarographic technique has been evolved for measuring lower levels (less than 0.02 mg.%) of disulfiram and its metabolite diethyldithiocarbamate by acid

hydrolysis of these compounds directly to CS<sub>2</sub> (Brown, Porter and Williams, 1974).

When the quantity of implanted disulfiram, 1 G, is compared with the total dose that would be given orally over a six-month period, 36-90 G, a large discrepancy appears. Ingested disulfiram is well absorbed and slowly excreted (Hald *et al.*, 1948; Eldjarn, 1950a, b), so the quantities given by parenteral and oral routes can be compared. The rate of 'absorption' of the dissolved tablets, 0.3 G over 3-6 weeks, could not be expected to give prolonged adequate blood levels.

Experiments are now being conducted with a soluble polyvinylpyrrolidone-linked preparation synthesized by one of us (A.W.) which it is hoped will produce greater bio-availability of the disulfiram.

#### CONCLUSIONS

Since the only demonstrable pharmacological activity following implant occurs during the first week, when patients are generally still in hospital, it is concluded that disulfiram implantation acts as a psychological rather than a pharmacological deterrent. The need exists for development of an alternative form of parenteral administration.

#### SUMMARY

Sixty-two alcoholic patients were treated by disulfiram implantation. At follow-up only three patients described any reaction on drinking and their symptoms were probably psychogenic.

Blood disulfiram levels above 0.1 mg.% were invariably found after oral disulfiram therapy. Such levels were occasionally recorded after implant, but only during the first post-operative week, when patients were usually still in hospital.

Carbon disulphide, a metabolite of disulfiram, was measurable in the exhaled breath of patients given oral disulfiram. Except in one case, this was not so after implantation.

It is believed that implantation does not give the patient pharmacologically active disulfiram cover, and that the deterrent effect of the procedure is psychological.

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## Diminution of Anterograde Amnesia Following Electroconvulsive Therapy

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### INTRODUCTION

The memory loss that follows a series of electroconvulsive therapy (ECT) treatments has been well documented. The amnesia appears to involve an impairment in the ability to acquire new memories, an impairment of memory for events that occurred shortly before ECT (Dornbush, 1972; Williams, 1966), and an impairment in the ability to recall material from remote memory (Janis, 1950; Squire, 1974a). Several characteristics of the anterograde amnesia produced by ECT have been the subject of contradictory reports. For example, it has been reported that memory functions can improve markedly or even return to pre-ECT levels within hours after the last of a short series of treatments (Brengelmann, 1959; Zinkin and Birtchnell, 1968; Zirkle, 1956). Yet, it has also been found that amnesic effects of a short series of treatments can be detected for weeks (Cronin, Bodley, Mather, Gardner and Tobin, 1970; Halliday, Davison, Browne and Krieger, 1968). Moreover, some reports suggest that memory recovers at the same rate following each of the first few treatments in a series (Brengelmann, 1959; Zinkin and Birtchnell, 1968), whereas other reports demonstrate that the effects of the first few treatments on memory can be cumulative (Bidder, Strain and Brunschwig, 1970). One explanation for such variant findings is that different memory tests have been employed in these studies. To obtain accurate estimates of the effects of ECT on memory, tests used to assess memory should be as sensitive as they can be to memory impairment. This point is particularly relevant, of course, to the evaluation of long-term effects of ECT on memory. Patients who had sustained partial temporal lobectomy could perform normally in tests of immediate reproduction

from memory, but were markedly impaired in tests that imposed long delays between learning and retention (Milner, 1958). Apparently tests involving delayed reproduction from memory are a more sensitive index of organic memory dysfunction than tests that involve immediate reproduction. The present study assessed the ability of patients receiving ECT to retain newly learned material for 30 minutes and 24 hours. The results of these delayed retention tests demonstrate that recovery from anterograde amnesia is quite gradual and that the effects of the first few ECT treatments on memory are cumulative; and underscore the value of such tests as sensitive indicators of possible long-term effects of ECT on memory

### METHOD

#### *Patients*

The subjects were psychiatric in-patients, residing on open wards, who had been prescribed a series of bilateral ECT treatments for relief of depressive illness. Patients were excluded from the study if they had other psychiatric disorders or neurological complications. Patients were also excluded if they had received ECT within the past twelve months or if treatment was discontinued before the fourth treatment. The decision to discontinue treatment was made by the patients' own psychiatrists, who had given prior approval for the research project but did not know which of their patients were participating. Patients receiving ECT were divided into two groups: one group (N = 9, mean age = 43; 5 female) was tested after each of their first four treatments; a second group, taken from the same population of patients (N = 9, mean age = 50; 7 female) was tested only after their fourth treatment; a third group (N = 6, mean age = 43; 5 female) consisted of patients from the same hospital who were diagnosed as depressed but were not receiving ECT treatment.

## ECT

Bilateral ECT was administered three times a week on alternate days. Following medication with atropine (0.8 mg.), methohexitone (60 mg.) and succinyl choline (30–40 mg.), current (500 ma., 2–3 sec.) was delivered with an Offner (Type 733) ECT machine. Electrode placement was temporal-parietal. In each case the attending physician reported that the current produced a well-modified grand mal seizure.

## Tests

Each learning task consisted of eight items: two drawings of common objects, two photographs of human faces, two nonsense line drawings, and two monosyllabic simple words. The order of presentation was always objects, faces, line drawings, words. The learning session began by asking the subject to inspect and name the objects on the first pair of cards. Before each new pair of items was presented, the examiner repeated the instructions, 'Look at these pictures/faces/words. Try to fix them in your mind so that if you should see them again you would be able to pick them out.' Patients were never told the length of the learning-retention interval. Retention was tested by a recognition format. Patients inspected ten objects, ten faces, six drawings, and ten words in that order. For each set of items, the instructions were: 'I am going to point to each picture/face/word. Say "Yes" if you think you have seen it before and "No" if you have not.' Each of these sets of items contained the originally learnt two items, embedded among novel items.

## Procedure

**Group 1.** Nine patients viewed a different set of eight items during each of three learning sessions, which were scheduled at spaced intervals following each of their first four ECT treatments. In all, 12 sets of eight items were used. The three learning sessions took place 20 minutes, 50 minutes and 180 minutes after ECT treatment. Thirty minutes after each of these learning sessions retention was tested by a recognition format. Retention of all the learnt material was also tested during one sitting about 24 hours after ECT. The first learning session each treatment day began when patients were sufficiently oriented to understand the instructions and to name both objects drawn on the first two cards (mean time after ECT = 20 minutes; range 15–28 minutes). All patients could give the year of their birth accurately at the time of this first learning session. The second (50-minute) learning session began immediately after the completion of recognition tests for the material learnt in the first session. The third

learning session occurred at a separate sitting 180 minutes after ECT treatment. The 24-hour retention test was relatively easy for normal subjects, because all the correct items had been exhibited during the course of the three 30-minute retention tests on the previous day. No feedback was given during the 30-minute retention tests; nevertheless, simply seeing and identifying correct items on this occasion could constitute rehearsal.

**Group 2.** Nine patients were treated identically to Group 1 except that they were tested only after their fourth ECT treatment. This group served to control for possible effects of practice or proactive interference on performance. The three sets of eight items used for this group were those shown to the patients in the first group after their first treatment.

**Group 3.** Six depressed patients not receiving ECT were treated identically to Group 2. As with Groups 1 and 2, the second learning session was scheduled 30 minutes after the first session and the third learning session was scheduled 120 minutes later.

## RESULTS

### Group 1

The effects of ECT on learning and retention after each of the first four treatments are presented in Fig. 1. Since patients made very few false positive responses (0.9/retention session), only correct positive responses have been considered. The data were submitted to a three-way analysis of variance with repeated measures on all factors. The effects of ECT-training interval and training-retention interval were highly significant ( $F = 112 (2.16)$ ,  $p < .001$ ;  $F = 22 (1.8)$ ,  $p < .001$ ), indicating that the ability to acquire new memories improved markedly during the first three hours after ECT, and that 24-hour retention was

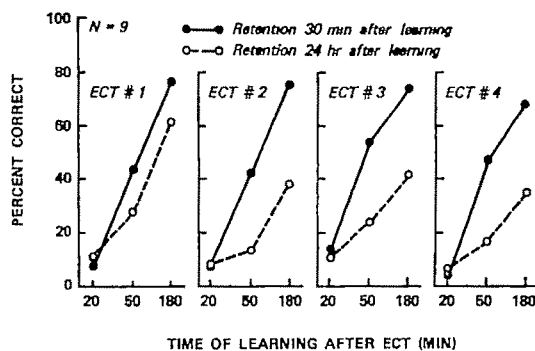


FIG. 1.—Retention scores for patients in Group 1, who were tested after each of their first four ECT treatments.



poorer than 30-minute retention. The effect of treatments was not significant ( $F = 1.4$  ( $2.16$ ),  $p > .1$ ). Two of the simple interactions were significant: ECT-training interval  $\times$  training-retention interval ( $F = 18$  ( $2.16$ ),  $p < .001$ ) and training-retention interval  $\times$  treatments ( $F = 4.8$  ( $3.24$ ),  $p < .01$ ). These significant interactions indicate (1) that the ability to retain material for 30 minutes recovered more rapidly after ECT than the ability to retain material for 24 hours, and (2) that the difference between 30-minute and 24-hour retention scores was not constant from treatment to treatment. Apparently the difference increased with successive treatments.

Orthogonal comparisons (Winer, 1958) further indicated that 24-hour retention was more affected by ECT than 30-minute retention. Thirty-minute retention scores recovered to about the same point after each ECT. Specifically, the 30-minute retention scores based on material learnt three hours after the first ECT were not different from the 30-minute retention scores based on material learnt three hours after the fourth ECT treatment ( $F = 0.1$  ( $1.24$ ),  $p > .1$ ). In contrast the equivalent comparison for 24-hour retention scores was significant ( $F = 5.3$  ( $1.24$ ),  $p < .05$ ). That is, 24-hour retention of material learnt three hours after the fourth treatment was lower than 24-hour retention of material learnt three hours after the first treatment. Thus there appears to be a detectable cumulative effect of ECT on memory as measured by the 24-hour delay task.

#### Group 2

Repeated testing following four successive ECT treatments could produce practice effects that might obscure cumulative effects of ECT on memory, or could produce proactive interference that would be difficult to distinguish from cumulative effects. However, the results from patients tested only after their fourth ECT treatment indicated clearly that no appreciable practice effects or interference effects occurred (Fig. 2a). Patients in Group 2 tested for the first time after their fourth treatment were not significantly different from patients in Group 1 who were tested for the fourth time after their fourth treatment ( $F = 0.1$  ( $1.16$ ),

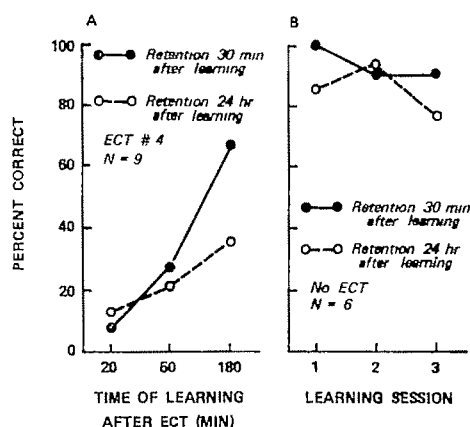


Fig. 2a.—Retention scores for patients in Group 2, who were tested only after their fourth ECT treatment.

Fig. 2b.—Retention scores for patients in Group 3, who did not receive ECT. The learning and retention sessions were spaced at the same intervals as for Groups 1 and 2.

$p > .1$ ; 3-way analysis of variance with repeated measures on two factors (Winer, 1958)).

#### Group 3

To determine the extent of recovery of memory after each ECT treatment, patients were tested who had not received ECT treatment (Fig. 2b). On the 30-minute retention tests these patients averaged 85 per cent correct.

Since patients in Groups 1 and 2 were not measurably different from the control patients in Group 3 on the final 30-minute retention test each day (69–76 per cent;  $F = 1.1$ – $2.3$  ( $1.13$ ),  $p > .1$ ), it would appear by this measure that recovery of memory was nearly complete by the third learning session three hours after ECT. However, 24-hour retention scores indicated that recovery of memory functions three hours after ECT was far from complete. Patients in Group 1 (Day 4) and patients in Group 2 scored 35 per cent for 24-hour retention of the material acquired in their third learning session. This score was significantly lower than the corresponding score of 77 per cent obtained by control patients in Group 3 ( $F = 10.4$ ,  $p < .01$  for Group 1 (Day 4) *vs.* Group 3;  $F = 15.7$ ,  $p < .01$  for Group 2 *vs.* Group 3). Thus the 24-hour-delay retention task was more sensitive to memory impairment than the 30-minute-delay retention task.

Since patients saw the same test material during the 30-minute retention test and again during the 24-hour retention test, they had an opportunity to identify items correctly 24 hours after learning which they had not recognized 30 minutes after learning. If this phenomenon appeared with a significant frequency, it would suggest that anterograde amnesia could be partially accounted for by a retrieval failure. If this phenomenon did not appear, the anterograde amnesia might best be explained in this instance as a failure to acquire and consolidate new information. The results indicated clearly that material was not identified correctly after 24 hours if it had not been identified at 30 minutes after ECT. The nine patients in Group 1 learned a total of 864 items ( $9 \text{ patients} \times 8 \text{ items} \times 3 \text{ learning sessions} \times 4 \text{ days}$ ). Of these 864 items, 273 were identified correctly during the 30-minute retention tests. Thus 591 items that were not recognized during the first retention test could possibly have been recognized later, if information about these items were still available in memory storage. In fact patients recognized 23 of these 591 items, or 3.9 per cent; and this number of correct choices was no greater than the number predicted on the basis of the guessing rates which patients exhibited in this study. During 24-hour retention tests these patients identified as 'correct' 136 out of 3,024 incorrect items, or 4.5 per cent. The few correct choices that were made for the first time during the 24-hour retention tests can therefore be attributed to guessing.

#### DISCUSSION

The results indicate that learning ability improved considerably during the first hours after ECT. The ability to retain material for 30 minutes recovered rapidly and was nearly normal by three hours after treatment, and the effects of ECT on 30-minute retention did not appear to be cumulative over the first four treatments. These results are in agreement with previous findings that the ability to reproduce material from memory after short delays can reach pre-ECT levels within a few hours after treatment and need not decline with repeated treatments (Bregelmann, 1959; Zinkin and

Birchneil, 1968; Zirkle, 1956). On the other hand, the ability to retain material for longer periods of time after learning appears to be more sensitive to ECT. Patients did far worse on 24-hour retention tests than on 30-minute retention tests, whereas patients not receiving ECT performed about the same on these two tests. Scores for 24-hour retention recovered relatively slowly after ECT treatment and by three hours were still well below control levels. Moreover, after the fourth treatment patients were less able to retain material for 24 hours than after the first treatment, indicating that the effects of ECT on 24-hour retention were somewhat cumulative.

Clearly, the conclusions one can draw about memory impairment depend to a great extent on how one measures memory. It has been demonstrated previously, for example, that tests with relatively short delays between learning and retention seem to be a more sensitive measure of the memory impairment produced by ECT than tests that do not involve delays (Cronholm and Ottosson, 1961; Halliday, Davison, Browne and Krieger, 1968). The results of the present study indicate that memory tests involving long delays between learning and retention are even more sensitive to ECT than tests involving short delays. Estimates of the duration of the memory impairment produced by ECT have typically depended on memory tests requiring immediate reproduction (e.g. paired associate learning tests, Cronin, Bodley, Mather, Gardner and Tobin, 1970) or on memory tests involving relatively short delays between learning and retention (e.g. up to three hours, Cronholm and Molander, 1964; Halliday, Davison, Browne and Krieger, 1968; Korin, Fink and Kwalwasser, 1956). Presumably, the results obtained by these methods could underestimate the duration of post-ECT amnesia. Follow-up studies should employ a variety of sensitive memory tests in order to obtain accurate estimates of the duration of post-ECT amnesia. The present findings suggest that long-delay retention tests might be particularly useful for this purpose.

The fact that long-delay retention tests are a sensitive measure of amnesia is consistent with

the results of a wide variety of animal studies. Taken together, this work indicates that amnesic agents accelerate forgetting (Squire, 1974b). Indeed, it is a common observation in animal studies for memory to be normal at short learning-retention intervals, but impaired at long learning-retention intervals (cf. Hughes, Barrett and Ray, 1970; Squire and Barondes, 1972). Amnesic agents such as convulsive stimulation could accelerate forgetting by accelerating the decline of short-term memory, by directly disturbing the incipient long-term memory, or by disrupting non-specific processes that are required for long-term memory to develop normally (Squire, 1974b). In any case, the result of amnesic treatment is that newly acquired memory will decay at a faster rate than normal memory. Obviously, the longer after learning that retention is tested the more likely it is that an existing difference in decay rates will be detected.

Finally, the results of studies of amnesia in animals and in humans have been variously interpreted as failures of storage or of retrieval mechanisms (Lewis, 1969; McGaugh and Dawson, 1971; Squire, 1974b). The fact that patients in the present study showed no tendency to recover memories once they had been forgotten is consistent with the notion that the anterograde amnesia produced by ECT reflects a failure to acquire and consolidate new information.

#### SUMMARY

Psychiatric patients receiving a series of bilateral electro-convulsive therapy for relief of depressive illness were given learning tests after each of their first four ECT treatments. Learning sessions took place 20 minutes, 50 minutes and 180 minutes after each treatment, and different material was learnt at each session. Recognition of the learnt material was assessed at 30 minutes and about 24 hours after each learning session. The results indicate that: (1) the ability to retain newly learnt material was initially impaired and then improved during the hours after each ECT treatment; (2) the ability to retain material for a 30-minute interval was impaired to about the same extent and improved at about the same rate after each

of the first four ECT treatments; and (3) the ability to retain material for a 24-hour interval was significantly poorer and improved more slowly after the fourth ECT treatment than after the first ECT treatment. The findings are consistent with the hypothesis that forgetting of material learned after ECT is abnormally rapid because the ability to store information is impaired. The results also demonstrate the usefulness of long-delay retention tests for assessment of ECT-produced memory impairment.

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## Response of Depressed Patients to Methylamphetamine

By L. G. KILOH, MEGAN NEILSON and GAVIN ANDREWS

In 1959, J. M. Roberts claimed that in 50 depressed women aged 40-60 years the response to the intravenous injection of 15 mg. methylamphetamine differentiated significantly between those diagnosed as 'psychotic' and those diagnosed as 'neurotic'. Following the injection each patient was observed closely for two to three hours, and in the great majority one of two responses occurred. Either the patient experienced a 'sustained period of general uplift of mood and a feeling of greater well-being'—the 'normalization' response; or the patient showed 'an immediate, or almost immediate, intensification of symptoms, particularly a worsening of any agitation present, often together with a deepening of the depressive affect'—the 'intensification' response. In only two patients, both with neurotic depression, was it not possible to classify the response.

Of 28 patients with neurotic depression, 25 showed a 'normalization' response, one an 'intensification' response and 2 atypical responses. Of the patients with psychotic depression, 16 showed an 'intensification' response and 3 a 'normalization' response. This might be considered to be in accord with the findings of Rudolf (1956), who as a result of a survey of the literature concluded that whereas ECT was the more effective remedy in 'involutional depression' and marginally so in 'manic-depression', in 'reactive depression' methylamphetamine was superior to ECT.

No replication study of Roberts' work has been traced in the literature, although a recent report by Fawcett and Siomopoulos (1971) suggests, if anything, the converse. Thirteen patients suffering from depression were given dextroamphetamine 15 mg. b.d. for three to four days. Of 11 patients with psychotic depression, six improved and one of the two patients with neurotic depression also improved while on the drug. A good response to amphetamines correlated significantly with subsequent response to tricyclic antidepressants.

### METHOD

In view of the striking claims of Roberts, the potential theoretical significance of his findings, and the possible value of the procedure as a diagnostic and prognostic test, it was included in a series of psycho-physiological measures carried out in the course of a study of depressive illness. There were 292 patients admitted to the study, 145 with a diagnosis of either endogenous or neurotic depression (Kiloh *et al.*, 1972a and b). From the criteria given in Roberts' paper, the diagnosis of psychotic depression would appear to coincide with our endogenous depression, and the term neurotic depression appears to have been used in a similar way in both studies.

In all, 191 patients of both sexes were given intravenous methylamphetamine in a dosage of 15 mg. These included 39 patients diagnosed as having endogenous depression, 56 with neurotic depression and 46 patients with depressive symptoms in a setting of personality disorder, sometimes with drug dependence, or associated with other neurotic symptoms of greater intensity than the depression. Finally, there were 20 schizophrenics, 7 patients with other psychoses, and 23 with neurosis or personality disorder, but not depressed. Patients over the age of 60 years were excluded from the methylamphetamine test, as were those with hypertension or severe anxiety. Ten schizophrenic patients with florid symptoms and disturbed behaviour were also rejected.

Each patient indicated one hour, two hours and three hours after the injection whether he felt better, worse, or unchanged in relation to his pre-injection state. Replies were assessed as better or worse according to the predominant response. Patients assessed unchanged recorded

no change at any time, while patients rated as 'fluctuant' claimed to be better, worse or unchanged on different occasions. Each patient also completed the Zung (1965) Self-rating Depression Scale (SDS) on the evening before the injection and again one hour after the injection.

### RESULTS AND DISCUSSION

Response to methylamphetamine in relation to diagnosis is given in Table I for all patients. There was a strong tendency for patients to feel better irrespective of diagnosis. No significant difference was found between the responses of patients with endogenous and neurotic depression to methylamphetamine. Indeed the trend, such as it was, seemed the opposite to that found by Roberts; in other words, relatively more neurotic depressives than endogenous depressives felt worse. When only the responses of female patients aged 40-60 years were examined, as in Roberts' study (Table II) again no significant difference in response was evident.

Comparison of SDS scores on successive evenings showed a slight mean improvement after methylamphetamine for both endogenously and neurotically depressed patients, with no significant difference in improvement between the two groups.

Because a majority of patients, irrespective of diagnosis, were assessed as feeling better it was of interest to find whether or not those groups who failed to improve possessed other identifying characteristics. As a group, those who felt worse after methylamphetamine showed a much

higher incidence of hysterical symptoms, hysterical personality traits or both than did the groups giving other responses ( $\chi^2 = 15.0$ ;  $p < 0.0005$ ). Similarly, among the group of patients who reported no change at any time after the injection there was a preponderance of drug and/or alcohol dependence ( $\chi^2 = 4.9$ ;  $p < 0.05$ ).

Of interest also were the responses of the 20 schizophrenic patients. It has been reported (Liddell and Weil-Malherbe, 1953; Simon and Taube, 1946; Levine, Rinkel and Greenblatt, 1948; Jonas, 1954; Lehmann and Ban, 1964; Pennes, 1954) that schizophrenic patients commonly show an aggravation of symptoms after intravenous methylamphetamine, and indeed this procedure has been described as having diagnostic value. Others have stated that amphetamine leads to an improvement in schizophrenic symptoms. Bischoff (1951), indeed, claimed that amphetamines given intravenously improved contact with reality and normalized thought processes in patients with schizophrenia of acute onset. It was in relation to work on schizophrenics that Pennes (1954) coined the terms 'normalization response' and 'intensification response' employed by Roberts. Pennes found that normalization occurred in 37 per cent and intensification in 20.4 per cent of his patients. In our series, only one of the 20 schizophrenic patients showed an aggravation of symptoms, while in 14 there was a brief improvement. It must be noted again that because of reports that schizophrenic symptoms were aggravated by methylamphetamine 10

TABLE I  
*Response to methylamphetamine according to diagnosis*

|              | Response to methylamphetamine |                     |                                              |                                                  |               |                 | Total |
|--------------|-------------------------------|---------------------|----------------------------------------------|--------------------------------------------------|---------------|-----------------|-------|
|              | Endogenous depression         | Neurotic depression | Neurosis or personality disorder (depressed) | Neurosis or personality disorder (not depressed) | Schizophrenia | Other psychosis |       |
| Worse ..     | 4                             | 14                  | 6                                            | 5                                                | 1             | 2               | 32    |
| Unchanged .. | 4                             | 6                   | 7                                            | 6                                                | 2             | 0               | 25    |
| Fluctuant .. | 3                             | 6                   | 4                                            | 1                                                | 3             | 0               | 17    |
| Better ..    | 28                            | 30                  | 29                                           | 11                                               | 14            | 5               | 117   |
| Total .      | 39                            | 56                  | 46                                           | 23                                               | 20            | 7               | 191   |

TABLE II  
*Response to methylamphetamine in depressed women  
aged 40-60 years*

| Response to methylamphetamine |    |                       |                     |       |
|-------------------------------|----|-----------------------|---------------------|-------|
|                               |    | Endogenous depression | Neurotic depression | Total |
| Worse ..                      | 4  | 2                     | 6                   |       |
| Unchanged ..                  | 2  | 1                     | 3                   |       |
| Fluctuant ..                  | 0  | 2                     | 2                   |       |
| Better ..                     | 13 | 5                     | 18                  |       |
| Total ..                      | 19 | 10                    | 29                  |       |

severely disturbed patients with paranoid delusions were excluded from the study.

Roberts related his findings to prognosis at one and three months after each patient had completed a course of ECT. The relationships was less strong than with diagnosis: at one month there was no significant difference in symptom scores on a slightly modified Hobson scale (1953), but at three months there was a significant difference at the 1 per cent level—those showing the 'intensification' response doing better.

In our series, treatment was not controlled but was specified as that most suitable for the individual patient by the clinician. Because of the variety of treatments used and the fact that

some—antidepressant drugs for example—necessarily had to be continued over long periods, it was not possible to use Roberts' system of assessment after one and three months. Patients were assessed on discharge from hospital. There was no significant association between response to methylamphetamine and outcome in any of the diagnostic groups (see Table III). When the total sample was considered and those patients rated worse after methylamphetamine were compared with the remainder, there was an over-representation of those with a poor outcome in the former group ( $\chi^2 = 4.9$ ;  $p < 0.05$ ). At six months after discharge the same comparisons were made, again with negative results; the relationship between poor methylamphetamine response and outcome was no longer demonstrable.

It has been pointed out (Leader, 1970) that the time of day at which the observation is made may affect experimental results and even vitiate them. It is possible, though not likely, that such a factor may have operated in these patients, as many of them showed a diurnal variation in their depression which might have been reflected in their response. Roberts appears to have carried out his investigations in mid or late morning, whereas in the present study the injections were given at approximately 4 p.m., the last of a series of investigations. Comparison

TABLE III  
*Response to methylamphetamine and outcome at discharge according to diagnosis*

| Response to methylamphetamine (outcome on discharge) |    |                            |          |                            |          |                                              |          |                                                  |          |                            |          |                            |          |                            |          |
|------------------------------------------------------|----|----------------------------|----------|----------------------------|----------|----------------------------------------------|----------|--------------------------------------------------|----------|----------------------------|----------|----------------------------|----------|----------------------------|----------|
|                                                      |    | Endogenous depression      |          | Neurotic depression        |          | Neurosis or personality disorder (depressed) |          | Neurosis or personality disorder (not depressed) |          | Schizophrenia              |          | Other psychosis            |          | Total                      |          |
|                                                      |    | Complete or part remission | Un-chgd. | Complete or part remission | Un-chgd. | Complete or part remission                   | Un-chgd. | Complete or part remission                       | Un-chgd. | Complete or part remission | Un-chgd. | Complete or part remission | Un-chgd. | Complete or part remission | Un-chgd. |
| Worse ..                                             | 3  | 1                          | 12       | 2                          | 1        | 5                                            | 3        | 2                                                | 1        | 0                          | 0        | 2                          | 20       | 12                         |          |
| Unchanged                                            | 4  | 0                          | 6        | 0                          | 6        | 1                                            | 4        | 2                                                | 1        | 1                          | 0        | 0                          | 21       | 4                          |          |
| Fluctuant                                            | 3  | 0                          | 4        | 2                          | 3        | 1                                            | 0        | 1                                                | 3        | 0                          | 0        | 0                          | 13       | 4                          |          |
| Better ..                                            | 28 | 0                          | 19       | 11                         | 23       | 6                                            | 9        | 2                                                | 12       | 2                          | 3        | 2                          | 94       | 23                         |          |
| Total ..                                             | 38 | 1                          | 41       | 15                         | 33       | 13                                           | 16       | 7                                                | 17       | 3                          | 3        | 4                          | 148      | 43                         |          |

of patients showing morning aggravation of depression with those whose depression was worse later in the day failed to show any significant difference in regard to their response to methylamphetamine.

The response to an intravenous injection of methylamphetamine would seem to have no diagnostic or prognostic significance within the group of depressive disorders.

#### SUMMARY

One hundred and ninety-one patients, including 39 with endogenous depression and 56 with neurotic depression were each given 15 mg. methylamphetamine intravenously. There was a strong tendency for all patients—including those with schizophrenia—to feel better, irrespective of diagnosis. No significant difference was found between the responses of patients with neurotic and those with endogenous depression. No significant relationship was established between prognosis on discharge from hospital and six months later in any diagnostic group.

Those patients who felt worse after methylamphetamine showed a high incidence of hysterical symptoms and/or hysterical personality traits ( $p < 0.0005$ ). Among those reporting no change there was a significant preponderance of those dependant on drugs or alcohol.

The response to intravenous methylamphetamine would appear to have no diagnostic or prognostic significance in patients with depressive illnesses.

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## Psychiatric Illness and Living in Flats

By N. C. MOORE

### INTRODUCTION

All the papers about flat dwelling (Central Housing Advisory Committee, 1952; Hopper, 1962; Hird, 1966; Fanning, 1967; Gunn, 1968; Gilloran, 1968 and Stewart, 1970) except one (Sheerboom, 1962) state that it has an adverse effect on mental health. They are almost unanimous in naming the care of children as a cause. The best study from a scientific point of view (Fanning, 1967) showed a significantly higher rate of psychiatric consultations among those living in the same flats as in the present study. This was thought to be due to social isolation caused by the nature of the flats and being confined in them by children. A widely held belief that bad housing can cause or aggravate mental illness is not justified by the evidence. Three investigations (Martin, Brotherton and Chave, 1957; Wilner, Walkley, Schram, Pinkerton and Tayback, 1960 and Hare and Shaw, 1965) failed to show any benefit to mental health from new housing. The only one (Taylor and Chave, 1964) to find an improvement studied new housing which was socially planned. All four studies failed to allow for two other variables. One was the adverse effect of the move itself (Maule and Martin, 1956; Hall, 1964 and Shepherd, Cooper, Brown and Kalton, 1966) on those in new housing. The other was moving to better old housing among controls (Wilner *et al.*, 1960).

Isolation is normally a problem in military communities (Densham-Booth, 1968). Cochlin (1969) thought that it was accentuated overseas, both geographically and by the language barrier, and that young wives were especially vulnerable, being ineligible for married quarters inside the units. She noted that television and jobs were unavailable to help overcome loneliness. In her opinion privacy was limited, because the same people lived and worked together, and discipline, particularly in respect

of married quarters, unaccompanied duty and mobility were resented.

### METHOD

Servicemen's families receive medical care as in a civilian general practice and before going overseas are screened to exclude those with serious illnesses. The practice covered in this study served three residential areas, Headquarters, 'Gross', and 'Klein', in a triangle and about 8 miles apart. All three had adequate social facilities. The Headquarters had more than 2,000 families of all ranks living in houses and flats. Gross was an estate of 396 flats and one house and had no officers' families. Klein was a community of 86 families, all living in flats, and non-commissioned. Four doctors ran the practice from a clinic at Headquarters and another at Gross. The former cared for all airmen working at Headquarters, any R.A.F. families living there and all families at Klein. The latter cared for all families at Gross. Servicemen were required to attend the medical centre at their place of work which often resulted in their belonging to different practices from their families.

Officers and their families were excluded from the investigation because all of them lived in houses and could not be matched socially with any flat dwellers. As none of the men living at Gross belonged to the practice there were too few men in flats to match with those in houses. The research involved the completion of questionnaires, so children were not included. It was therefore confined to 688 wives of non-commissioned servicemen, of whom 500 lived in flats and 188 in houses.

Almost the entire flat population, 482 wives (96 per cent), lived at Gross and Klein and all but one of the house population, 187 wives (99 per cent), at Headquarters. The blocks of flats varied in size from 6 to 35 family units,



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assumptions was tested by comparing these groups.

Information on two aspects was provided by only 487 wives from flats and 169 from houses. Of these, only 57 from flats (12 per cent) and 15 from houses (9 per cent) spoke German, and more of the former, 158 (32 per cent), than

of the latter, 31 (18 per cent), took the oral contraceptive.

It can be seen that, in general, flat dwellers were of low rank (Table I), young (Table II), had small families (Table III) and had arrived recently in their accommodation (Table IV) and in Germany (Table V). More of them

TABLE I  
*The distribution of the wives by their husbands' ranks*

| Accommodation   | Rank    |          |          |                |                 | Total |
|-----------------|---------|----------|----------|----------------|-----------------|-------|
|                 | Private | Corporal | Sergeant | Staff Sergeant | Warrant Officer |       |
| 500 flats .. .. | 21%     | 38%      | 23%      | 9%             | 8%              | 100%  |
| 188 houses ..   | 4%      | 26%      | 33%      | 15%            | 22%             | 100%  |

TABLE II  
*The distribution of the wives by their ages*

| Accommodation   | Age   |       |       |             | Total |
|-----------------|-------|-------|-------|-------------|-------|
|                 | 15-24 | 25-34 | 35-44 | 45 and over |       |
| 500 flats .. .. | 23%   | 52%   | 19%   | 6%          | 100%  |
| 188 houses ..   | 8%    | 43%   | 30%   | 18%         | 100%  |

TABLE III  
*The distribution of the wives by the sizes of their families*

| Accommodation   | Number of children |     |     |       |           | Total |
|-----------------|--------------------|-----|-----|-------|-----------|-------|
|                 | None               | One | Two | Three | 4 or more |       |
| 500 flats .. .. | 17%                | 29% | 32% | 16%   | 7%        | 100%  |
| 188 houses ..   | 15%                | 24% | 34% | 13%   | 13%       | 100%  |

TABLE IV  
*The distribution of the wives by their dates of arrival in accommodation*

| Accommodation   | Date of arrival in accommodation |                   |                   |                   |                   | Total |
|-----------------|----------------------------------|-------------------|-------------------|-------------------|-------------------|-------|
|                 | Before<br>1 July 1967            | July-Dec.<br>1967 | Jan.-June<br>1968 | July-Dec.<br>1968 | Jan.-June<br>1969 |       |
| 500 flats .. .. | 9%                               | 11%               | 13%               | 33%               | 34%               | 100%  |
| 188 houses ..   | 13%                              | 20%               | 18%               | 24%               | 25%               | 100%  |

and apart from one tower block at Klein, were of three and four storeys. Most of the low rise blocks were dominating and drab in appearance. All 18 flats (4 per cent) at Headquarters and 396 (79 per cent) at Gross had communal entrances and stairways serving either 6 or 8 flats. The remaining 86 flats (17 per cent) were at Klein and were in attractive blocks of three types. There was the tower block of 7 storeys with access by a lift to a corridor, serving five flats, on each floor. There was a four-storey block of two-storey maisonettes, where the families appreciated having an upstairs and downstairs. Access was by two corridors, each serving six flats and reached by a staircase. The remaining blocks were the same as in the other areas. The amounts of psychiatric illness were compared in high and low blocks, in those with balcony and staircase access and on different floors.

Cases were identified by two methods:

(i) *By scoring 50 or more on the Cornell Medical Index (CMI) (Brodman, Erdmann and Wolff, 1956).* Many workers in the United Kingdom, including Culpan, Davies and Oppenheim (1960), Brown and Fry (1962) and Caldbeck-Meenan (1966), have shown that the lower of the two recommended scoring levels is not a realistic cut-off point for identifying clinical psychiatric illness. Nevertheless, by using a higher scoring level, they and others (Leigh and Marley, 1956; and Shepherd *et al.*, 1966) found the CMI to be reliable in assessing the psychological status of the patient concerned. The higher recommended scoring level, an overall total of 50 or more in the entire CMI, was the one used in this study.

(ii) *By consulting their general practitioner for psychiatric illness.* The other measure was the first consultation rate (Registrar General, 1954), during a six-month period of observation, for any illness in which the doctor detected 'an important psychiatric component' (Kessel, 1960). There were 97 such illnesses from the 500 wives in flats (19 per cent) and 28 from the 188 in houses (15 per cent). Thirty-one flat dwellers suffered from anxiety, 22 from nervous tension, 21 from depression and 11 from insomnia. Five had both anxiety and depression,

3 premenstrual tension, and 2 globus hystericus. One had fainted, and another had a left temporal lobe disorder. Seven house dwellers were diagnosed as having anxiety, 9 nervous tension, 3 depression and 2 insomnia. Frigidity, puerperal depression, paranoid psychosis, alcoholism, thyrotoxicosis, hypertension and a prolapsed intervertebral disc were the illnesses suffered by the remaining 7 house dwellers.

The population studied was that occupying the accommodation during the week (in May, 1969) when the questionnaires were distributed. The 656 wives who completed CMI's consisted of 95 per cent of the total, and of these 487 (97 per cent) lived in flats highly significantly more than the 169 (90 per cent) in houses. ( $p < 0.01$ ). All tests of significance were by the Chi Square test (Hill, 1966).

A large number, 255 flat dwellers (51 per cent) and 53 house dwellers (28 per cent), left their accommodation in less than one year, but only 40 flat dwellers (8 per cent) and 2 house dwellers (1 per cent) in less than six months. The period of observation, therefore, had to be limited to the first six months of residence. Those in residence before it began were observed during the first six months of the survey.

The flat dwellers at Klein had to travel by bus to consult their doctor, whereas those in the other areas had only a short walk to theirs. The difference in the proximity of the Medical Centres may have affected the threshold of consultation in different residential areas. Before including the flat dwellers at Klein in the comparison of flat and house dwellers it was necessary to discover the effect of this variable. This was done by comparing the incidence of psychiatric illness in the flat dwellers at Klein and Gross.

Of the 500 living in flats, 331 (66 per cent) belonged to the R.A.F., and of the 188 in houses 187 (99 per cent) did so. The remainder belonged to the Army. There were 42 Canadian families living in flats and none in houses. Because no differences were seen between the wives of soldiers and airmen or between British and Canadian wives, it was not considered necessary to match for service or nationality. However, the validity of these

TABLE V  
*The distribution of the wives by their dates of arrival in Germany*

| Accommodation   | Date of arrival in Germany |                   |                   |                   |                   | Total |
|-----------------|----------------------------|-------------------|-------------------|-------------------|-------------------|-------|
|                 | Before<br>1 July 1967      | July-Dec.<br>1967 | Jan.-June<br>1968 | July-Dec.<br>1968 | Jan.-June<br>1969 |       |
| 500 flats .. .. | 20%                        | 15%               | 12%               | 33%               | 20%               | 100%  |
| 188 houses ..   | 39%                        | 15%               | 13%               | 24%               | 8%                | 100%  |

took the oral contraceptive and spoke German. Those at Klein had to travel further to their Medical Centre. All these variables, except the one under study, were eliminated by matching in the following comparisons.

#### RESULTS

All 86 flat dwellers at Klein were matched with the same number at Gross, the only variable being the proximity of their Medical Centres. Only 10 at Klein (12 per cent) consulted their doctor, significantly fewer ( $p < 0.01$ ) than the 25 (29 per cent) at Gross, whereas there was no significant difference in CMI cases, there being 21 (24 per cent) at Klein and 13 (15 per cent) at Gross.

In 81 matched Army and R.A.F. wives there were the same number of CMI cases, 13 (16 per cent), while 18 of the former (22 per cent) and 22 of the latter (27 per cent) consulted their doctor. The 39 pairs of matched Canadian and British women had 2 CMI cases (5 per cent) and 5 G.P. cases (13 per cent) among the former, and 1 CMI case (3 per cent) and 6 G.P. cases (15 per cent) among the latter. None of these differences was significant.

Among 35 matched pairs there were 9 CMI cases (26 per cent) in low blocks and 8 (23 per cent) in the tower block. There were 11 CMI cases (28 per cent) from staircase access and 9 (23 per cent) from balcony access flats in 39 matched pairs. The numbers of consultations in these two comparisons were too small for valid statistical analysis. The CMI identified 15 cases (20 per cent) from the ground floor and 13 (18 per cent) from the top, and there were 14 (19 per cent) from both floors who consulted their doctor among 73 matched pairs. None of

the differences in these three comparisons was significant.

One hundred and seventy-three matched senior (Sergeant and above) and junior (Corporal and below) ranks had 24 CMI cases (14 per cent) and 32 G.P. cases (18 per cent) among seniors and 32 CMI cases (18 per cent) and 38 G.P. cases (22 per cent) among juniors. In a controlled comparison of 30 pairs there were 6 CMI cases (20 per cent) and 3 G.P. cases (10 per cent) in those over 45 and 4 CMI cases (13 per cent) and 6 G.P. cases (20 per cent) in those under that age. In those with and without children 80 pairs were matched and the former had 10 CMI cases (12 per cent) and 17 G.P. cases (21 per cent) while the latter had 13 CMI cases (16 per cent) and 14 G.P. cases (17 per cent). The CMI identified 8 wives (15 per cent) in those in accommodation before January 1968 and 10 (18 per cent) after that date while the early arrivals had 4 consultations (7 per cent) and late 11 (20 per cent) from a total of 55 pairs. Those in Germany before January 1969 had 18 CMI cases (19 per cent) and 16 G.P. cases (17 per cent) and those after that date 15 CMI (16 per cent) and 21 G.P. (23 per cent) in 93 pairs. Among 56 German-speakers there were 9 CMI (16 per cent) and 11 G.P. cases (20 per cent) compared with 8 CMI (14 per cent) and 11 G.P. (20 per cent) in the same number of non-German speakers. Finally, in 158 users of the contraceptive pill there were 17 CMI (11 per cent) and 28 G.P. (18 per cent) compared with 22 CMI (14 per cent) and 29 G.P. (18 per cent) among non-users. None of these differences reached significance.

The 169 house dwellers, who completed CMI's, were matched with flat dwellers. There

were 20 cases (12 per cent) in flats and 12 (7 per cent) in houses, using the CMI, and 39 (23 per cent) G.P. patients in flats and 26 (15 per cent) in houses, these differences not being significant.

#### DISCUSSION

##### *Method of investigation*

The first consultation rate used by Fanning (1967) depends not only on the type of practice but also on the diagnostic skill, criteria and attitude of the doctor (College of General Practitioners, 1958; Kessel, 1960; Kessel and Shepherd, 1962; Shepherd *et al.*, 1966). It also depends on the proximity of his surgery, the habits of different social classes and their type of accommodation. Flat dwellers may be bored and isolated and have a low 'surrender point' (*British Medical Journal*, 1967) resulting in a high consultation rate. This may explain the apparent higher rate of psychiatric illness found by Fanning, as well as the absence of an equivalent increase in hospital referrals. Even if the increase was real it may have been due to one of the differences in the compositions of the house and flat populations rather than the type of accommodation.

As the CMI was completed at home, selection of patients because of doctors' attitudes was avoided, and the mentally ill who did not consult were not overlooked. Cases were identified by scoring levels so that variations in criteria, classification and diagnosis were eliminated. Nevertheless, high scores on the CMI cannot be assumed to be synonymous with clinical psychiatric illness. So the first consultation rate was also used, in spite of its shortcomings. The simple and clear cut definition suggested by Kessel (1960) was used, so that identification of psychiatric cases remained constant. Any individual variation in its interpretation by the doctors was unimportant, as they cared equally for the populations being compared.

The flat and house populations were different in composition because of the system of allocation. The accommodation was given to the highest ranks with longest service and most children. The 500 families allocated a flat, could, after a compulsory six months residence, apply for a house but only 196 (39 per cent)

chose to move. This explains why hardly anybody was resident for less than six months, whereas a great number were resident for less than one year. Flat dwellers had more recently moved to a foreign country and because they were young and inexperienced were less able to cope. Matching for the dates of arrival in Germany was therefore necessary. As this did not allow for the second move of those house dwellers who had originally been in flats, the dates of moving into accommodation were also matched.

The Registrar General's (1966) classification allocates all members of the armed forces to the same socio-economic class, yet there are obvious differences in the social and financial status of different ranks. The Hall-Jones scale of occupational prestige (Oppenheim, 1966) is more realistic, describing Sergeants and above as 'supervisory' and Corporals and below as 'skilled manual'. As the rank, and therefore social class, structures of flat and house populations were different, all comparisons were matched in this respect. However, no difference was found in the incidence of psychiatric illness in senior and junior ranks. Age, which was proportional to the number of years' service, and the number of children also required matching.

German-speaking women were slightly more common among flat dwellers. As it helped them to overcome the social dislocation of the move, and many of them were German-born anyway, this attribute was also matched. As more wives in flats used the oral contraceptive, which is associated with psychiatric illness (Goldzieher, Moses, Averkin, Scheel and Taber, 1971), the comparisons were also matched in this respect.

The number of CMI cases at Klein was the same as elsewhere. The artificially low number of G.P. cases was due to the high threshold of consultation caused by having no medical centre nearby. To avoid this variable, no further comparisons were made between Klein and the other two areas. Comparisons between the other two areas were also kept to a minimum to avoid any differences in social amenities.

##### *Validity of the findings*

It may be unwise to generalize from the

findings of this survey. Service families, with little choice of accommodation, a limited time of residence, and screened to exclude the most serious illnesses are probably not representative of flat dwellers in general. This screening, of course, did not invalidate comparisons between flat and house dwellers. There were no sampling errors in this investigation, as the total population was studied, but the small size of many samples may have prevented the differences from reaching significance. In fact, most of the trends were in the direction expected. The flats studied were almost entirely low rise, unlike the tower blocks mostly criticized in previous studies. However, apart from Fanning (1967), who studied low rise flats, these papers were journalistic in nature, making their conclusions of doubtful value.

The first six months of the survey was the observation period for those already in accommodation before it began. If they had settled by that time, they may have had fewer consultations than during their first six months of residence. In such comparisons, therefore, the CMI figures are more reliable than those from G.P. consultations. The CMI's were completed in May 1969, by which time many flat dwellers had been resident longer than the one and a half years since the beginning of the survey in January 1968. There was no difference, in CMI scores, between those who had been in flats for longer or shorter than this period of one and a half years. It may be that even this period is not sufficient time for psychiatric illness to emerge. Although Germans and Canadians were more likely to have experienced flat dwelling previously, they did not have a different level of psychiatric illness from the British. These findings suggest that psychiatric illness was not reduced by familiarity with flat dwelling or increased by exposure to it.

Those living at Gross had adequate social facilities, but many of these facilities were in the areas surrounding the estate and one needed to speak German to use them. Amenities were available at the Headquarters, which was self-sufficient, but the Gross dwellers had to make a bigger effort to use them than had the residents. To ensure complete matching for social amenities it would have been desirable to compare the

18 flat dwellers at the Headquarters with the house dwellers in the same area. Unfortunately, the numbers of psychiatric cases were too few for valid statistical analysis.

Questionnaire respondents and non-respondents differ in important respects, and response rates as low as 10 per cent are not unknown, while one of the highest in the survey literature was 81 per cent (Moser, 1958). In this survey, any error due to non-response was unusually small, amounting to only 5 per cent. The number of non-respondents was so small that statistical analysis of the differences between them and the respondents was not possible, but no gross differences were apparent. For example, the expected number of G.P. cases among the former in flats, if they had not differed from the latter, was 3 while the observed number was 1. In houses the expected number was 3 and the observed number 2. From the information available, it appears that the respondents represented the population under study, and conclusions about them were valid for the whole. The significantly better response from flat dwellers was probably due to a belief that they had more to gain from such a survey.

#### CONCLUSIONS

Neither of two independent measures of psychiatric illness was higher among flat dwellers than house dwellers, conflicting with the findings of all previous investigators. This is the more surprising considering that many of them would not have voluntarily chosen their accommodation and that the house area's social amenities were probably superior. The consultation rate was not increased among flat dwellers, disproving the theory that they have a lower 'surrender point' (*British Medical Journal*, 1967) leading to an apparently higher level of psychiatric illness. Mental health was not affected by the type of block, or the floor level, in disagreement with Fanning (1967) who found that it deteriorated with the height of the flat. He also found a low level of psychiatric illness in women aged 30-39 which he assumed was because they were not confined to their flats by their children, who were of school age. In this survey, neither age nor having children affected mental illness, contradicting the commonly held



view that the supervision of children is a contributory factor.

The mental health of Army and R.A.F. wives or of Canadian and British wives did not differ, justifying the decision not to match these variables. Those in Germany for six months or less and those resident longer had the same number of CMI cases, indicating that living in a foreign country did not affect mental health. The absence of an association between psychiatric illness and the oral contraceptive may possibly be due to the effects on different types being balanced, for example, increases in depression against decreases in premenstrual tension.

#### SUMMARY

Flat dwelling did not cause an increase in psychiatric illness, nor did familiarity cause an improvement or increased exposure a deterioration. The incidence of psychiatric illness was the same on different floor levels and in different types of block (whether high, low, with balcony or staircase access). Rank, age, the number of children, the use of the oral contraceptive, nationality and the type of military force were not correlated with psychiatric illness in flat dwellers. The threshold of consultation was the same in flats as in houses but got higher as the distance to the doctor's surgery increased.

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## Synopses of Papers Awaiting Publication

**Depression in Medical In-patients.** By H. S. MOFFIC and E. S. PAYKEL.

Occurrence and features of depression were studied in 150 medical in-patients. At initial interview within a week of admission a total of 24 per cent met a criterion for depression based on the Beck Depression Inventory. Although they showed the usual clinical features, few were recognized or referred to psychiatrists. Depression was commoner in those with more severe medical illness, more concomitant stress, and more previous depressions. In most cases the occurrence and course appeared closely bound up with the medical illness. When comparisons were made with depressives in psychiatric treatment, the medical depressives were less severely depressed. With severity equated, medical depressives showed more feelings of pessimism, helplessness, anxiety and self-pity, but less suicidal feeling. In general their state appeared more appropriate to the life situation, suggesting some characteristics of a borderline between normal and pathological depressed mood.

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**Multivariate Analysis—The Need for Data and Other Problems.** By B. S. EVERITT.

Multivariate analyses, for example principal components analysis and factor analysis, are used more and more frequently in psychology and psychiatry. In this paper some of the problems of using such techniques in practice are discussed. One of the main problems is that in general little consideration is given to the size of the ratio of  $N$  to  $p$  needed to make any multivariate analysis worthwhile, and in many cases sample sizes which are too small in relation to the number of variables considered are used. This may give misleading results. Other problems considered are the elimination of 'outliers' and interpretation of results.

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**Objectives and Training in Psychiatry.** By PETER BROOK.

The need for setting out objectives of training, expressed clearly, precisely formulated in behavioural terms, and which can be observed and measured, is widely accepted. In this country, the Royal College of Psychiatrists educational programmes are based on the recommendations made in 1963 by the World Health Organization, in 1967 by the Nuffield Provincial Hospital Trust, and by the Royal Medico-Psychological Association at the Conference on Postgraduate Medical Education in 1969. None of the documents in which these proposals are made, nor the recent memorandum on Educational Programmes produced by the Royal College of Psychiatrists, outline well defined, specific, assessable and detailed objectives. To construct these in a wholly satisfactory way demands an analysis of the knowledge, skills and attitudes of an effective psychiatrist, but pending such research an interim set of objectives should be formulated by the Royal College of Psychiatrists.

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**Educational Attainment in Adolescent School Phobia.** By IAN BERG, TONY COLLINS, RALPH MCGUIRE and JOHN O'MELIA.

The educational attainment of 100 school phobic youngsters was compared to that of 100 other psychiatric patients, using the reading quotient as the main measure. Age and IQ were allowed for. RQs were, on average, higher in the school-phobic group than the other cases, except in a small number of younger children of high IQ. Additional comparisons with another group of psychiatric patients and the general population, using regression equations, failed to provide any evidence of poor educational attainment in school phobia.

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## Book Reviews

### PSYCHODYNAMICS

**A Home for the Heart.** By BRUNO BETTELHEIM.  
London: Thames and Hudson, 1974. Pp. 461.  
Price £4.50.

This book describes the therapeutic approach of the Orthogenic School at the University of Chicago. The method is the brainchild of the author and reflects his personal philosophy in the treatment of a group of children, adolescents and young adults suffering mainly from schizophrenia. He insists that half measures will not do for the psychiatric patient and only the best is good enough, and the book shows the type of high quality care that can be achieved when financial and other resources are not significantly limiting factors. The luxurious appointments conveyed in the colour plates are likely to provoke envy amongst psychiatrists who are obliged to work in more limiting environments, but Dr. Bettelheim is not unfamiliar with the worst institutions man has yet devised, namely Dachau and Buchenwald of which he had grim personal experience. His approach, indeed, reflects the very antithesis of his own war experience.

He sees personal attention, love and complete emotional security as prime requirements for therapy and he is convinced that the restoration of true self-esteem is the main goal of treatment. Everything that increases the patient's feelings of being a good worthwhile person is therapeutic, while everything that diminishes that feeling aggravates the disturbance. No detail in the hospital milieu is neglected, and anybody interested in milieu therapy will find much absorbing material. His therapeutic community is far from unique but bears his own hallmark. The system is democratic, and all, including staff and patients, have their say; but one is left with the impression that Dr. Bettelheim is in firm control and that what he says goes.

There may be justifiable scepticism about the author's claim that personalized milieu therapy has a specific curative value in schizophrenia. Mayer-Gross, a well known critic of the specific value of psychotherapy in schizophrenia, agreed that every schizophrenic could benefit from the tender loving care of an unsophisticated nursemaid, but asked whether skilled therapists could achieve much more. The claim to good results in autistic children must be weighed against the recent suggestion that such

disorders are not infrequently the result of inborn defects in the ability to handle visual and auditory signals, which may be amenable to language therapy. There are notable omissions, particularly the place of drugs in the treatment of young schizophrenics.

The warmth, sagacity and insight of Dr. Bettelheim are likely to appeal to many psychiatrists, particularly those whose leanings are away from the medical model. His international reputation will ensure world-wide readership.

J. A. HARRINGTON.

**The Freud/Jung Letters.** Edited by WILLIAM MCGUIRE. London: The Hogarth Press and Routledge and Kegan Paul, 1974. Pp. v+589.  
Index 58 pp. Price £7.95.

A very large tome, excellently produced and containing some 359 communications between Freud and Jung. The steady deterioration in their relationship over seven years becomes quite clear. They agree on most things at the beginning and end up being at loggerheads with each other, both professionally and personally.

This book is of great interest to everyone and the reaction of the reader will definitely be commensurate with his partisan attitude. The non-analyst will find it instructively amusing.

G. C. HELLER.

### DEPRESSION

**Depression: Theory and Research.** By JOSEPH BECKER. Chichester: John Wiley, for V. H. Winston and Sons, 1974. Pp. 239. Price £6.65.

This work is a product of considerable scholarship. It presents a balanced condensation of over 560 references up to and including the year 1972. It may be regarded as a source book for the researcher rather than a textbook for the clinician, but the student who requires a clear account of the development of psychodynamic views will find no better presentation. The chief areas covered in the work are those of classification, epidemiology, psychodynamic, behavioural and psychosocial theories, personality functioning and biological aspects. There is no consideration of treatment, and certain other topics such as childhood depression, psychosomatic presentations and suicide, are missing.

The present work may be compared with another important American single-author text, Aaron T.

Beck's *Depression: Clinical, Experimental and Theoretical Aspects* (Harper and Ross, 1967; Staples Press, London, 1969). Beck's work, appearing some years before the volume under review, is a combination of a clinician's analysis of current research and a presentation of his own investigations into measurement of depression, dream content and his personal approach to psychotherapy. The clinician and the teacher can find in Beck's work a wider range of material, including considerations of treatment, than in the present volume, but much of this may be due for revision. Beck, for instance, devotes a chapter to the historical development and current research surrounding the concept of Involuntional Melancholia as a syndrome, but he dismisses the biogenic amines in less than a page. In the volume under review, the reverse is true.

The researcher certainly requires this new book; he will find in it clear exposition and trenchant analysis of many areas of investigation. The clinician and the candidate for higher examinations will profit from a perusal of both books; they complement each other well.

R. P. SNAITH.

#### COMMUNITY MENTAL HEALTH

##### **Latino Mental Health. A Review of Literature.**

By AMADO M. PADILLA and RENE A. RUIZ.  
National Institute of Mental Health. DHEW  
Publication No. (HSM) 73-9143. 1973. Pp. 189.  
Price \$1.95.

The authors review the literature on the mental health of Spanish speaking minority groups in the U.S.A. In a 1971 census, 9 million U.S. citizens were identified as being of 'Spanish origin', and this total included 5 million Mexican Americans, almost 1.5 million Puerto Ricans, and more than 600,000 Cubans. Most of these people would speak Spanish as a first language. Statistics show a consistent pattern of socio-economic disadvantage as judged by low income, unemployment, and poor educational attainment. The high prevalence of alcoholism and of serious drug involvement is well documented. Epidemiological data on the generality of mental illness are, however, less reliably available. There appears to be a low suicide rate. A low rate of self-referral to psychiatric facilities might be a reflection of underlying prevalence, or more probably might indicate a relative unwillingness to engage in contact with institutions which are largely controlled by the 'Anglo' majority.

The concept of mental health which the authors take as basis of the review's remit is a broad one. Sections deal with what is known about normal coping behaviours and normal culturally related self-

images, with measurements of intelligence, and with assessment of academic performance. The implications of bilingualism are discussed at length. An important section deals with problems of prejudice and discrimination: 'zoot suits' are favoured by Mexicans, a district attorney is quoted as stating that 'zoot suits are an open indication of subversive character', and the Los Angeles City Council is recorded as having made the wearing of zoot suits a misdemeanour. Any reader of the *British Journal of Psychiatry* who is a particularly sharp dresser might like to note these facts before visiting California.

The joke is clearly not so funny if you are a Mexican American migrant worker caught up in a cycle of poverty, a man who sees no great hope either for himself or for his children, a member of a minority ethnic group who finds himself constantly up against very tangible prejudice.

The authors document and analyse the nature of the problem in a manner which is critical and well-balanced. When it comes to any proposals for a solution, one becomes aware that although the scope of the book may imply an already wide definition of mental health, if the economic and political perspectives are still not also taken into account the proposed solutions may ring rather hollow. That the authors should propose that slum-dwelling Puerto Ricans should receive 'sensitivity training' so as to 'expand consciousness', certainly rings strangely.

This book should be read by everyone who is interested in community mental health, and in the meanings and limitations of 'prevention'. The authors offer us much food for properly worried thought.

GRIFFITH EDWARDS.

#### PSYCHOLOGY

**Clinical Psychology: The Study of Personality and Behaviour.** By SOL. L. GARFIELD. Chicago: Aldine Publishing Co. 1974. Pp. xv+461. Index 15 pp. Price \$14.95 (cloth), \$8.95 (paperback).

This is a book of clinical psychology suitable for use at undergraduate level. It reviews—albeit superficially—a wide range of subjects. Topics covered include: a historical review of the development of clinical psychology; an account of theories of personality and behaviour illustrating the diversity that exists in this field; several chapters deal with the problems of diagnosis and assessment of personality, others with the description of the different methods of psychotherapy employed in clinical practice, including one on behaviour therapies. There is also a section dealing with some aspects of community psychology and mental health, and one devoted to the problems, trends and areas of clinical research.

The sections covering the appraisal of mental functioning and that concerned with the assessment of mental impairment are weak points in the book.

The general approach of the author to the different topics is descriptive rather than analytical.

There is an author index, and a not very comprehensive subject index. References appear at the end of each chapter.

MARIA WYKE.

**New Approaches in Psychological Measurement.** Edited by PAUL KLINE. London: John Wiley and Sons. 1973. Pp. ix+269. Index 11 pp. Price £5.50.

Most busy clinicians will have little time or appetite for huge compendia listing and evaluating psychological tests, such as the awe-inspiring volumes by Buros. Dr. Kline has produced a stimulating and useful book which is of manageable size and mostly written in clear and entertaining style. Specialist writers have each written on new developments in the field. Chapters include Levy on test theory, Butcher on intelligence and creativity, Bannister and Bott on grid technique and Gale on EEG studies. Other chapters by Holley and Semeonoff deal with various projective methods and the Rorschach. Kline contributes from his own area of expertise in reviewing assessment of psychodynamic theories. The coverage of the book is fairly selective (this reviewer's bias would have included chapters on assessment of children). However, within each chapter, reviews are cool, critical and reasonably comprehensive. There is constant examination of hard data and yet the book is happily free from those simplistic attempts to wish psychodynamic theory and practice away which often accompany moves to make us more scientific.

This book is welcome and can be thoroughly recommended to both psychiatrists and clinical psychologists as an up-to-date collection of useful reference papers.

LAWRENCE BARTAK.

**The Measurement of Intelligence.** Edited by H. J. EYSENCK. Lancaster: Medical and Technical Publishing Co. 1973. Pp. xii+488. Price £8.50.

The papers reprinted in this volume illustrate the attempts by psychologists to develop a scientific approach to the measurement of intelligence. The collection is divided into nine topics, and includes sections devoted to 'Measurement and the Problem of Units', 'Types of Intelligence', two sections on 'Heredity and Environment' and one which covers 'The Biological Basis of Intelligence'. Eysenck has

provided a specially written introduction and conclusion to the collection, and each section is provided with its own short introduction.

A noteworthy section is devoted to the approach to intelligence measurement evolved by Eysenck and his colleagues. This includes the only previously unpublished paper in the volume. It is by Owen White of the Institute of Psychiatry, and describes a mathematical model for the analysis of problem solving which he is currently developing.

This book is mainly for specialists, and its publication may serve to counter, if not silence, the recent upsurge of criticism of intelligence tests.

M. BERGER.

### ADDICTION

**The Social Control of Drugs.** By PHILIP BEAN. London: Martin Robertson & Co. Law in Society Series. 1974. Pp. 198. Price £3.95 (cloth), £1.95 (paper).

Bean's starting point is the assertion that in the present day world it has become 'sociologically axiomatic to insist that deviant behaviour cannot be studied in isolation from the formal and informal mechanisms which are adopted for controlling it'.

The fundamental sociological tenet that society is as much deserving of analysis as the individual whom society labels as deviant has in many ways proved fruitful, although the idea seems sometimes to over-reach itself. That the whole business of drug legislation should be scrutinized in terms of the often hidden springs of society's fears and motivations is a type of exercise to be welcomed and encouraged. The insights which sociology may offer as to the nature of society may often be no more quantifiable or susceptible of 'proof' than the insights which psychoanalysis may offer as to the nature of the individual, but in both instances the insights (if intuitively accurate) may have profound and humane power.

In tackling the subject of drug legislation with the techniques of sociological analysis Bean is therefore taking on a topic much in need of study. In this country Jock Young has already made some notable contributions in this area, but there is still much work to be done in establishing the historical origins of drug legislation, in determining the part that international pressures have played in shaping our national response, in analysing the manner in which police interpretation of the law shapes the actual functioning of the control system. Bean informatively reviews a great deal of the available evidence and offers interpretations which are provocative and largely well-founded.

But some of those interpretations are difficult to

accept—intuitively they just don't seem right. Does this imply that the patient is suffering from resistance, or that the analyst's proffered insights are sometimes past-the-point? For instance, when we are told that the 1967 Dangerous Drugs Act was concerned with '“nipping in the bud” any possible agent for change,' we have the uneasy feeling that the sociologist has been listening insufficiently to the actual evidence. The way in which evidence is arrayed in this book is also at times slightly worrying. Weiner's work on 'drug takers' is quoted as evidence that the family background of the 'drug taker' is not different from that of normals; that Weiner was largely dealing with adolescents who were engaged in only more-or-less casual drug experimentation is not properly stressed, but the ground is prepared for the argument that amorphous 'drug taking' is not related to personality problems, that addiction is not 'sickness'. The number of minor factual inaccuracies which are to be found in the text contribute to the impression that the hot pursuit of argument is sometimes rather leaping ahead of scholarship.

With these reservations duly noted, this is, however, an undoubtedly informative and lively book which deserves to be read and widely debated.

GRIFFITH EDWARDS.

#### FAMILY PLANNING

**Parents and Family Planning Service.** By ANN CARTWRIGHT. London: Routledge and Kegan Paul. 1974. Pp. xx+283. Index 9 pp. Price (paperback) £1.25.

This is a report of a study made in England and Wales which set out to look 'at the information, advice and help about contraception that is given to parents of young children and describes the barriers towards more adequate and acceptable services'. To achieve this aim, Ann Cartwright's team interviewed nearly 1,500 mothers of newly-born children and some 250 fathers, sought the views of the parents' general practitioners together with those of the health visitors involved, and collected information about the Family Planning Clinics situated in the areas studied.

The findings make depressing reading. Too many parents are still using ineffective methods of birth control (withdrawal is the next commonest after the sheath). The barriers to more effective contraception are not those based on religion but the absence of a

readily available method which mothers can regard as reliable and free from health risk. Moreover, family planning services are inadequate and generally are least available where they are most needed.

The survey's findings make it clear that too often general practitioners are inadequately trained to provide an effective contraceptive service. The author recommends a proliferation of different kinds of service, including a domiciliary one, and an expansion of hospital clinics. General practitioners and health visitors should play a more active role, particularly by offering advice and help without waiting to be asked.

This book is of interest to all doctors and deserves a place in the hospital library. It could perhaps have been made easier to read if more of the tables had been put in an appendix.

PETER BROOK.

#### BIOCHEMISTRY

**Chemical Modulation of Brain Function—**

**A Tribute to J. E. P. Toman.** Edited by H. C. SABELLI. New York: Raven. 1973. Pp. 331. Index 5 pp. Price D.Fl.53.00.

This book is a tribute to the memory of a great pharmacologist, and consists of nineteen papers on various aspects of neurochemistry including five papers on the ubiquitous catecholamines, two papers on pharmacological kinetics, four on convulsants and anticonvulsants and three on clinical syndromes. As is inevitable in a multiauthored book of this kind, the standard varies. Of particular interest to clinicians are the papers by Millichap on the clinical efficacy of convulsants; by Sabelli and Giardina on the amine modulation of affective behaviour; by Greenberg and by Himwich's group on dimethyltryptamines found in schizophrenic urine. An especially interesting paper is by Krivoy and Zimmerman on the possible role of polypeptides in synaptic transmission. They present evidence to suggest that substance P, ACTH, B-MSH and bradykinin, besides their more familiar functions, may act as modulators of synaptic transmission in the brain. Moreover, some of the effects of certain agents such as morphine, chlorpromazine and d-LSD may be mediated via this mechanism. The chemistry of the brain becomes more complex and fascinating daily.

J. R. SMYTHIES.

## Books Received

### PSYCHIATRY, PSYCHOANALYSIS AND PSYCHOLOGY

- Psychological Differentiation; Studies of Development.** By H. A. WITKIN, R. B. DYK, H. F. FATERSON, D. R. GOODENOUGH and S. A. KARP. *John Wiley*. Price £8.00, £2.70 (paperback).
- Mechanisms in Symptom Formation, Proceedings of the International College of Psychosomatic Medicine.** Amsterdam, June 1973. Edited by H. MURAPH. *S. Karger*. Price £14.00.
- Adventure in Psychiatry.** By D. V. MARTIN. *Faber and Faber for Cassirer*. (Paperback of second edition). Price £1.50.
- Innovative Treatment Methods in Psychopathology.** Edited by K. S. CALHOUN, H. E. ADAMS and K. M. MITCHELL. *John Wiley*. Price not stated.
- An Introduction to Psychopathology.** By S. H. FRAZIER and A. C. CARR. *Jason Aronson*. Price \$10.00.
- Psychiatric Illness—Diagnosis, Management and Treatment for General Practitioners and Students.** By H. MERSKEY and W. LAWTON TONGE. Second edition. *Baillière Tindall*. Price £2.80.
- A Practical Handbook of Psychiatry.** Edited by J. R. NOVELLO. *Charles C. Thomas*. Price \$16.75.
- The Year Book of Psychiatry and Applied Mental Health 1974.** *Lloyd-Luke for Year Book Medical Publishers*. Price £10.75.
- Lecture Notes on Psychiatry.** By J. WILLIS. Fourth edition. *Blackwell Scientific Publications*. Price £1.25.
- Ethical Standards in Counselling.** Edited by H. J. BLACKHAM. *Bedford Square Press*. Price 80p.
- Psychoneuroendocrinology—Proceedings of the Workshop Conference of the International Society for Psychoneuroendocrinology.** Micken, 3-5 September 1973. Edited by N. HATOTANI. *S. Karger*. Price \$49.00.

### HISTORY

- Psychiatry for the Poor—1851 Colney Hatch Asylum—Friern Hospital 1973—A Medical and Social History.** By R. HUNTER and I. MAGALPINE. *Dawsons*. Price £4.50, £1.50 (paperback).

### DEATH AND DYING

- The Right to Die—Decisions and Decision Makers.** By THE GROUP FOR THE ADVANCEMENT OF PSYCHIATRY. *Jason Aronson*. Price \$7.50.
- Dying and Dignity—The Meaning and Control of a Personal Death.** By M. J. KRANT. *Charles C. Thomas*. Price \$7.95; \$5.95 (paperback).
- Living or Dying—Adaptation to Hemodialysis.** Edited by N. B. LEVY. *Charles C. Thomas*. Price \$10.75.
- Fears Related to Death and Suicide.** By M. J. FELDMAN *et al.* *MSS Information Corporation*. Price \$15.00.

### MENTAL RETARDATION

- Mental Retardation: Concepts of Education and Research—Proceedings of Symposia 12, 13 and 14—held at the Middlesex Hospital Medical School 1972/73.** Edited by J. TIZARD. *Butterworths for the Institute for Research into Mental and Multiple Handicap*. Price £3.00.
- A Study on the Origins of Mental Retardation.** By M. IIVANAINEN. *Heinemann Medical Books*. Price £4.40.
- The Experimental Psychology of Mental Retardation.** Edited by D. K. ROUTH. *Crosby Lockwood and Staples*. Price £6.00.

### SCHIZOPHRENIA

- Schizophrenia at Home.** By G. GREER and J. WING. *National Schizophrenia Fellowship*. Price £1.50.
- Interpretation of Schizophrenia.** Second edition. By S. ARJETI. *Crosby Lockwood Staples*. Price £8.00.

### SEXOLOGY

- Deviant Sexual Behaviour: Modification and Assessment.** By J. BANGROFT. *Oxford University Press*. Price £5.00.
- Male Homosexuals—their Problems and Adaptations.** By M. S. WEINBERG and J. WILLIAMS. *Oxford University Press*. Price £3.50.
- Clinical Sexuality.** By J. F. OLIVEN. Third edition. *J. B. Lippincott*. Price £12.00.

- COMMUNITY, SOCIAL AND ALLIED MATTERS**  
**Experiments in the Rehabilitation of the Mentally Handicapped.** Edited by H. C. GUNZBURG. *Butterworths*. Price £5.80.

- People with Dyslexia—Report of a Working Party commissioned by the British Council for Rehabilitation of the Disabled.** *British Council for Rehabilitation of the Disabled*. Price £2.50.

- Proceedings of the Conference on Psychiatric Case Registers at the University of Aberdeen, March 1973.** Department of Health and Social Security. Statistical and Research Report No. 7. *H.M.S.O.* Price 85p.

- Law Liberty and Psychiatry—An Inquiry into the Social Uses of Mental Health Practice.** By T. S. SZASZ. *Routledge and Kegan Paul*. Price £4.95.

### AUDIOVISUAL AIDS (FILM STRIPS)

- Music Therapy for Handicapped Children.** Devised by B. REAK. *Camera Talks Ltd*. Price £3.95.
- Mentally Handicapped People—produced in Co-operation with Hertfordshire County Council.** *Camera Talks Ltd*. Price £3.95.

Many of these books will be reviewed at a later date.



## Correspondence

Letters for publication in the Correspondence columns should be addressed to:

The Editor, British Journal of Psychiatry, Chandos House, 2 Queen Anne Street, London, W1M 9LE

### ABRUPT WITHDRAWAL OF ANTIPARKINSONIAN DRUGS IN CHRONIC SCHIZOPHRENIC PATIENTS

DEAR SIR,

Dr. Peter Hall (*Journal*, July 1974, p. 110) has made a number of pertinent comments on our article (*Journal*, Feb. 1974, p. 151). We would like to discuss these and draw the attention of readers to some recent publications.

(1) Our trial excluded patients aged over 70 years, and this does indeed limit the practical application of our findings. We could have emphasized this in our discussion. (2) We did not find that an increased number of patients on depot injections 'developed' extrapyramidal symptoms when AP drugs were withdrawn. The table heading and the text make it clear that there was a one point *deterioration* on the rating scales. In the discussion we note that EPS have been found to be very common in patients on neuroleptic drugs, whether or not receiving AP medication. The 'deterioration' in our patients was found on careful neurological examination and did not cause patient discomfort or warrant AP resumption. Such deterioration was therefore statistically and clinically non-significant. It should be distinguished from the overt clinical relapse in a small minority of our patients. (3) Our low relapse rate compared with other studies from the U.S.A. could well be a reflection of the lower neuroleptic dosage regimes used in this country, and we discussed this very point. (4) We accept that the peripheral side effects are more marked with benzhexol. The central side effects do occur with other AP drugs (El-Yousef, *et al.* 1973; Meyler and Herxheimer, 1972).

While our article was in press two further investigations on chronic schizophrenic patients have been published. A double-blind cross-over study by Mindham *et al.* (1972) showed no difference in parkinsonian side effects in 35 patients on fluphenazine decanoate (25 mgm. every four weeks) irrespective of whether they were taking amantidine, orphenadrine or placebo. Chien *et al.* (1974) studied 41 patients on fluphenazine enanthate (average dose

37.5 mgm. every 13.2 days) and found that the incidence of EPS was similar whichever one of three AP drug regimes were in use (one regime entailed AP medication only at the time of occurrence of acute EPS), but that severe EPS were less frequent in the maintenance AP medication groups. These authors concluded that the routine prophylactic use of AP drugs with depot injections was questionable, but further research was necessary. Their more equivocal findings compared with the studies of other investigators, including Mindham and ourselves, are probably due to their use of the enanthate preparation in higher doses.

The development of tardive dyskinesia in patients on neuroleptics causes considerable concern. Articles by Klawans (1973), Fann *et al.* (1974), Gerlach *et al.* (1974), implicate the anticholinergic action of AP drugs in accentuating a dopaminergic-cholinergic imbalance that is believed to be responsible for the dyskinetic movements. If confirmed, this makes the cautious use of AP drugs imperative.

We feel that the weight of evidence is against routine long-term prescribing of antiparkinsonian medication with neuroleptics. That some patients continue to need AP drugs we do not deny, but the clinician should actively determine which patients are in such need. We have had no difficulty in doing this on an out-patient basis by careful dosage reduction.

H. A. McLELLAND, G. BLESSED, S. BHATE.  
*St. Nicholas Hospital,*  
*Gosforth,*  
*Newcastle upon Tyne, NE3 3XT.*

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#### EFFECT OF PHENYTOIN ON SERUM PHENOBARBITONE LEVELS

DEAR SIR,

Although the clinical importance of the observations is still unclear, the influence of phenobarbitone on serum phenytoin levels in epileptics is well documented, e.g. Kutt *et al.* (1969) and Sotaniemi *et al.* (1970). However, the converse relationship has received little attention. I wish to report some preliminary findings on the relationship between serum phenobarbitone levels and dose during long-term phenobarbitone administration, with and without the concurrent administration of phenytoin.

Steady-state anticonvulsant levels were determined, using the isothermal gas liquid chromatographic procedure of Toseland *et al.* (1972). The estimations were performed on serum samples from male mentally retarded epileptic in-patients of Stoke Park Hospital, Bristol. The patients fell into two groups: Group 1 consisted of 54 patients receiving phenobarbitone for anticonvulsant therapy, and Group 2 consisted of 21 patients receiving phenobarbitone with phenytoin. The mean ages of the patients in the two groups were 35.5 years (range 15-68) and 33.4 years (range 16-56) respectively. All patients had been receiving anticonvulsant therapy for a number of years. Two patients in Group 1, and three patients in Group 2 were receiving drugs for disorders other than epilepsy.

The results of a total of 106 estimations are displayed graphically in the accompanying figures. It was found that for a given dose of phenobarbitone the mean serum phenobarbitone concentration was significantly greater in patients receiving this drug in combination with phenytoin than it was in patients receiving phenobarbitone alone. The relationships between serum levels and dose of phenobarbitone are given by the regression equations  $y = 7.14x + 2.14$  for Group 1, and  $y = 9.58x + 6.70$  for Group 2. The correlation coefficients for the two groups were respectively 0.79 ( $p < 0.001$ ) and 0.74 ( $p < 0.001$ ), validating the claim of Buchthal and Lennox-Buchthal (1972) that serum phenobarbitone levels correlate reasonably well with dose of the drug. The

serum levels of phenobarbitone in the patients on combined therapy could not be related either to the serum levels or to dosage of phenytoin.

The elevation of serum phenobarbitone concentrations by methylphenidate has been described by Garrettson *et al.* (1969), and Rizzo and co-workers

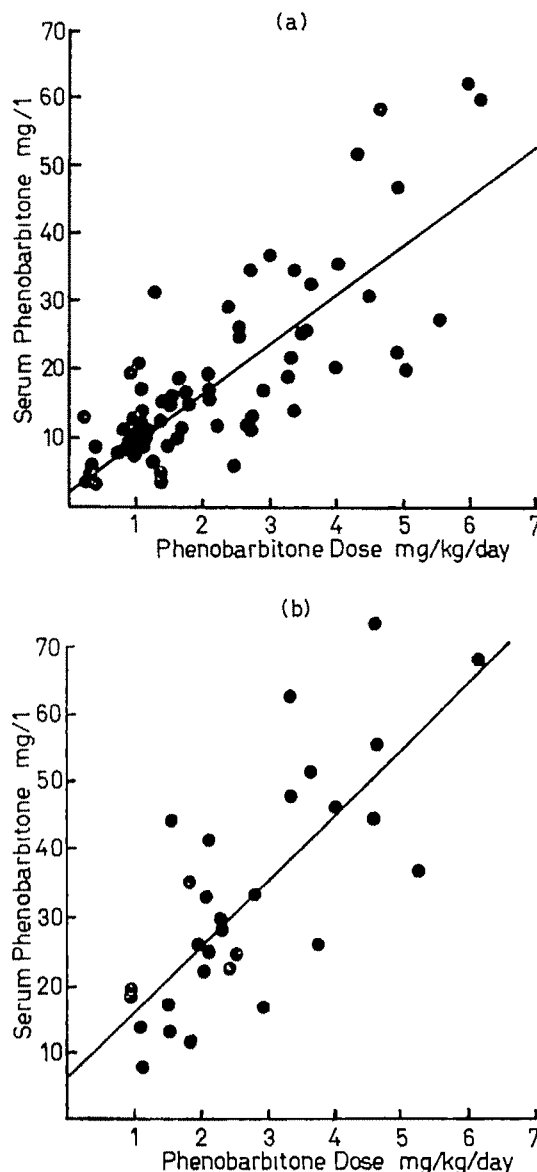


FIG.—Serum phenobarbitone concentrations plotted against the phenobarbitone dose in epileptic patients receiving phenobarbitone (a) and phenobarbitone and phenytoin (b) anticonvulsant therapy.

(1972) have shown, in acute experiments, that phenytoin enhances plasma phenobarbitone levels in rats. Morselli *et al.* (1971) showed that administration of phenytoin to five children who had been receiving phenobarbitone 'for at least 15 days' caused a 1.5 to 4-fold elevation of plasma phenobarbitone levels 'after several days of combined treatment'. The findings presented here show that a similar effect occurs during long-term combined phenobarbitone and phenytoin therapy. The biochemical mechanism underlying this effect remains to be clarified, as does its relation to seizure control. The findings would indicate the necessity of monitoring serum phenobarbitone, as well as phenytoin, levels in epileptic patients receiving combination anticonvulsant therapy.

I should like to thank Dr. J. Jancar, Consultant Psychiatrist, Stoke Park Hospital, for permission to study his patients.

J. D. CAMERON.

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#### TEMPERATURE FALL AFTER ECT

DEAR SIR,

Has anyone noticed a fall in temperature in those patients who have had ECT? I have found a fall in temperature in all of ten patients who have been receiving ECT for depression. The fall in temperature varied from a 2 °C-5 °C and lasts for about one to two hours. A fall begins within fifteen to thirty minutes of receiving ECT. The anaesthetic used was methohexitone sodium (Brietal) and the relaxant used was suxethonium bromide (Brevidil).

I am postulating that one of the temperature-regulating centres in the hypothalamus is interfered with by ECT—either as a direct action of the electrical current or indirectly through the fronto-hypothalamic pathways. It may be that the alteration of body temperature after ECT results from stimulation of the anterior centre rather than being part of the normal body homeostasis.

It is interesting to note that the hypothalamus is an important area for mood change in animals. This hypothesis would suggest that possible mood centres in the hypothalamus are influenced by ECT as well as the temperature regulation centres, and would thus account for the remarkable way in which ECT alters a depressed patient's affect for the better in such a short time.

P. V. F. COSGROVE.

Barrow Hospital,  
Barrow Gurney,  
Near Bristol.

UNIVERSITY OF TASMANIA

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Applications are invited for the Chair of Psychiatry which will become vacant at the end of 1974, when the present professor, Professor A. S. Henderson, takes up appointment in Canberra as Director of the first National Health and Medical Research Council Research Unit, the Social Psychiatry Research Unit.

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Further particulars and general conditions of appointment are available from the Association of Commonwealth Universities (Appts), 36 Gordon Square, London WC1H 0PF.

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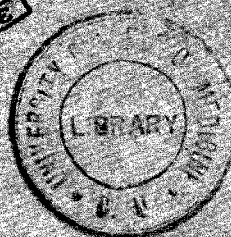
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- 1 *Modern Med.*, 17, 438, 1972
- 2 *Practitioner*, 210, 135, 1973
- 3 *Am.J.Psychiatr.*, 130, 1142, 1973
- 4 *Practitioner*, 198, 80, 1967
- 5 *J.Roy.Coll.Gen.Practit.*, 23, Suppl. 2, 33, 1973
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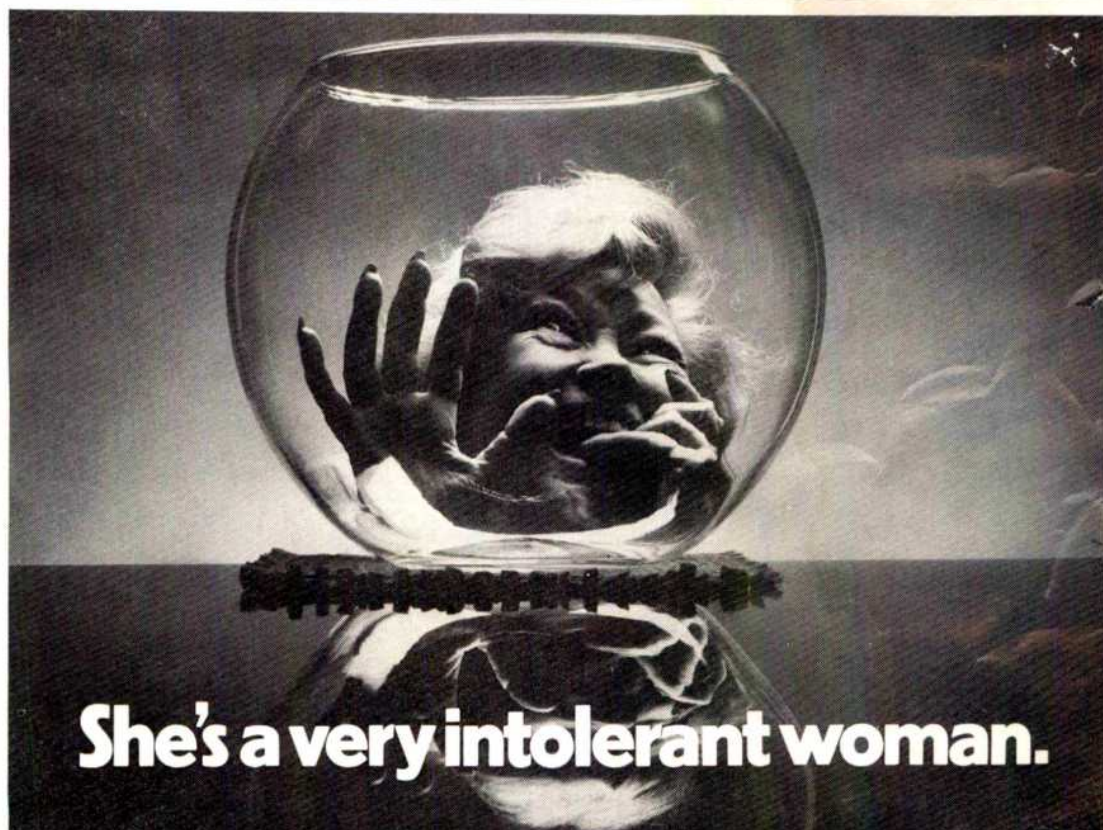
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The daily dosage should always be divided, owing to the slow absorption (10-16 h), and rapid metabolism of Androcur.

##### Contra-indications

Acute disturbances of liver function.

Malignant tumours and existing diseases of the endocrine glands.

A history of thrombotic or embolic disease.

Severe chronic depression.

##### Side-effects

Inhibition of spermatogenesis. The sperm count and the volume of ejaculate are reduced. Infertility is usual, and there may be azoospermia after 8 weeks. There is usually slight atrophy of the seminiferous tubules. Follow-up examinations have shown these changes to be reversible.

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Other changes that have been reported in isolated cases, some of which may be true side-effects of Androcur are:

Testicular pain.

Transient pain, loss and reduced growth of body hair, increased growth of scalp hair and lightening of hair colour.

Healing of acne vulgaris.

Weight changes.

Female sex distribution and abdominal striae.

Numbness.

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Autonomic imbalance (gastro and cardiovascular disturbances, sweating, disturbance of blood pressure, etc.).

##### Precautions and special information

Chronic liver disease. Although contra-indicated in acute liver disease, Androcur shows good liver tolerance in chronic. Nevertheless, liver function tests should be done before and every 4-6 weeks during treatment in patients who have chronic liver disease.

Diabetes. Androcur has an influence on carbohydrate metabolism. A special diet is advised in poorly controlled diabetes and the levels of glucose in the blood and urine should be examined in all diabetic or prediabetic patients before and every 4-6 weeks during treatment.

Chronic alcoholism. Alcohol appears to reduce the effect of Androcur, which is of no value in chronic alcoholics.

Haemoglobin. Hypochromic anaemia has been found rarely during long-term treatment, and blood counts before and at intervals of 4-6 weeks during treatment are advisable.

Nitrogen balance. A negative nitrogen balance is usual at the start of treatment, but does not persist.

Spermatogenesis. A spermatozoogram should be recorded before starting treatment in patients of procreative age, as a guide against attribution of permanent infertility to Androcur at a later stage. It should be noted that the decline in spermatogenesis is slow, and Androcur should, therefore, not be regarded as a male contraceptive.

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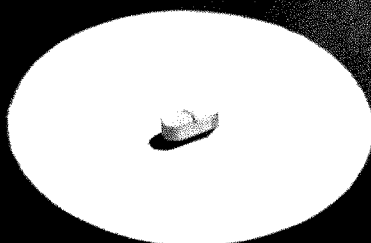
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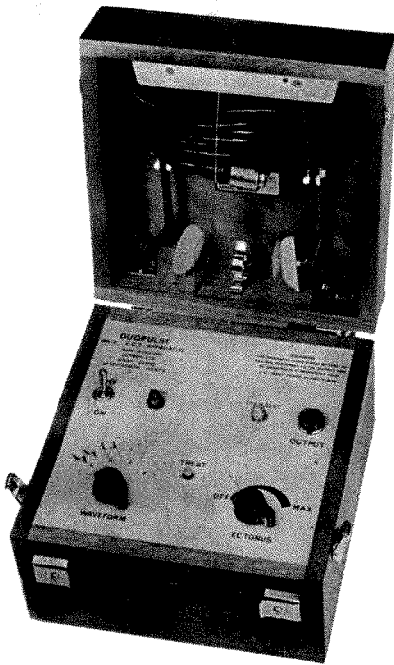
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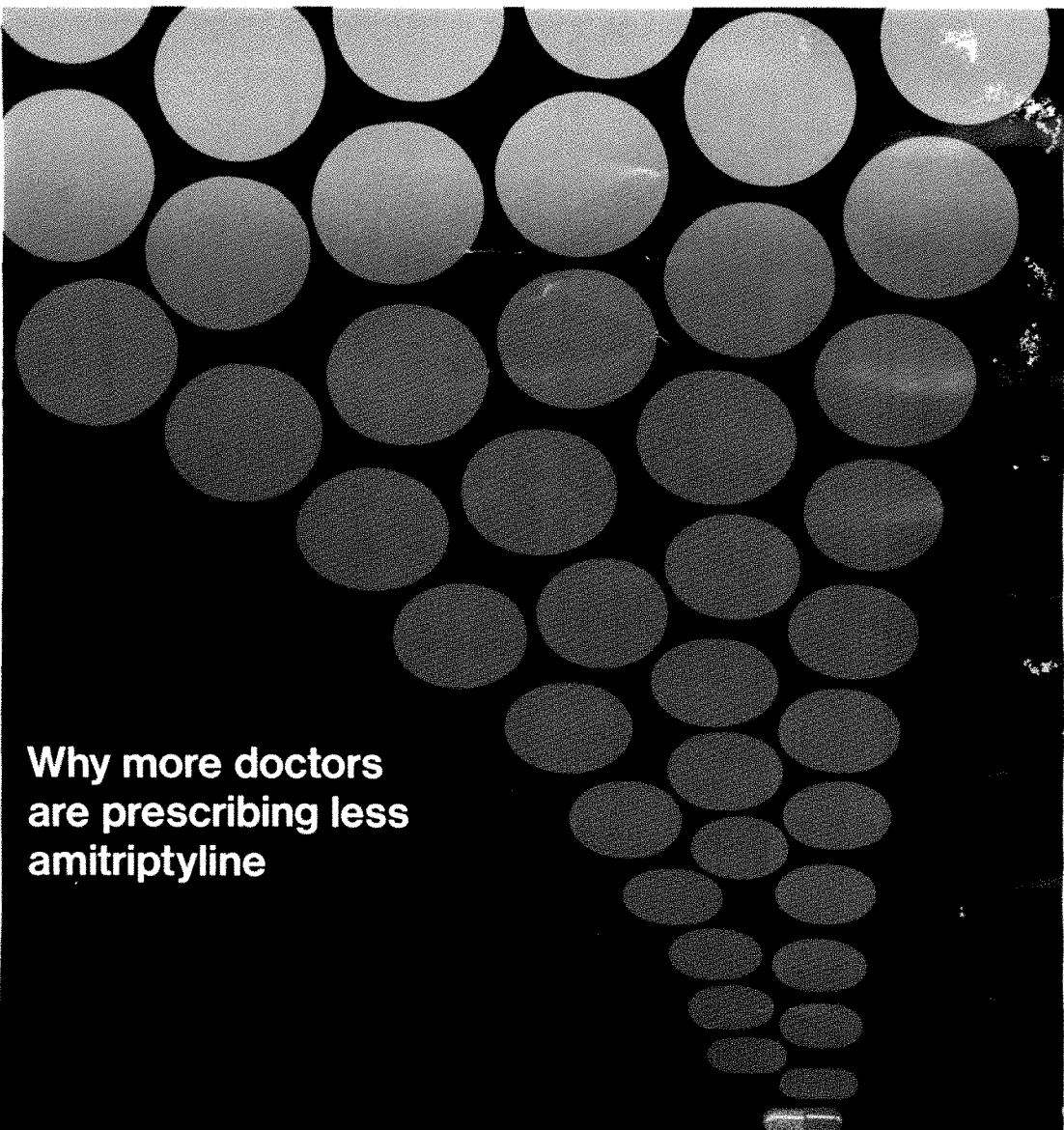
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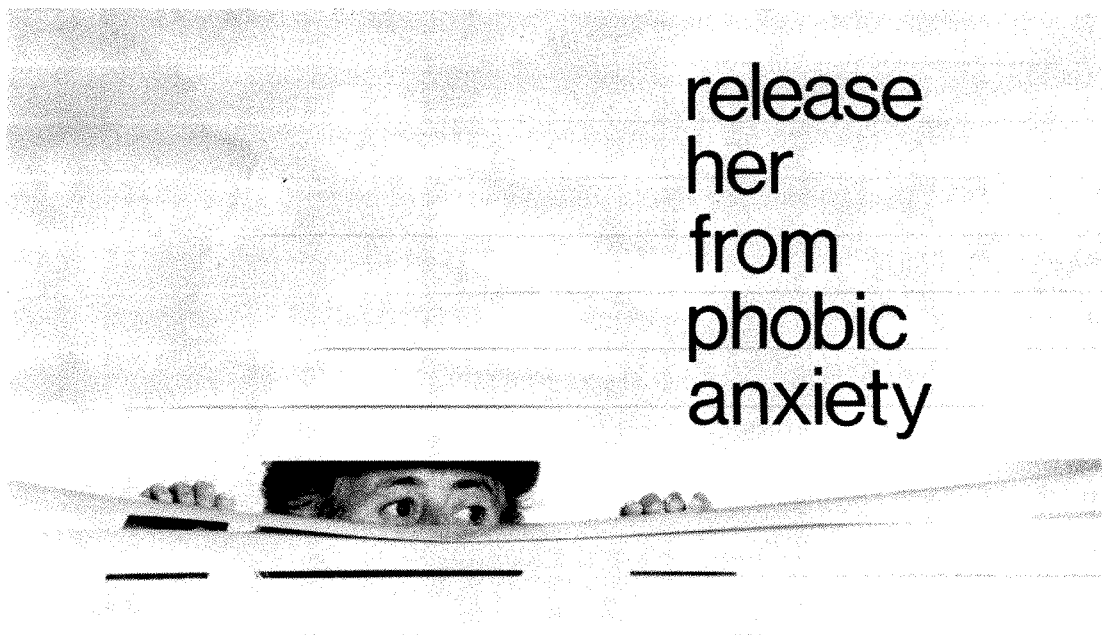
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17:2 (1973) **The Court and the Expert: Legal/Penal/Psychiatric Problems**

17:3 (1973) **Treating the Violent Disturbed Offender.** Individual and group treatment of particularly difficult cases are described by court and prison psychiatrists from Germany and Massachusetts, experts from Louisiana and Nevada, the director of a Canadian community home, the principal of an Illinois 'blighted area' school who started life as a social worker, and the principal of an English school for handicapped children who has been a Juvenile Court Magistrate. The inherent social factors that doom to failure so many of our efforts at rehabilitation are examined by Professor Bindman.

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18:3 (1974) From New Zealand, Dr. Williams, who has worked for nine years as voluntary prison visitor, describes his methods and results. Some years ago, Scotland established a new system for the handling of juvenile offenders; this is described by two prominent Scots experts and evaluated by a Professor of Law from the U.S.A. From Massachusetts, we have several clinical articles, with case material. Dr. Pogrebin queries the use of a psychiatric facility for parole evaluation, and various other controversial legal/penal/psychiatric problems are debated.

1975: Our Special Issue on **Treating the Violent Disturbed Offender** (17:3, 1973) has attracted so much interest that we are planning a second one on this topic for 1975 (19:1). This issue will include: Psychiatric Treatment of Violent Patients in Private Practice—Depression and Violence that Pervades Prisons—Delayed Reactions of Vietnam Veterans—Adolescent Body Image Distortions and Burn Injuries—Helping Battered Wives in England—Can Solitary Confinement be Used Constructively?

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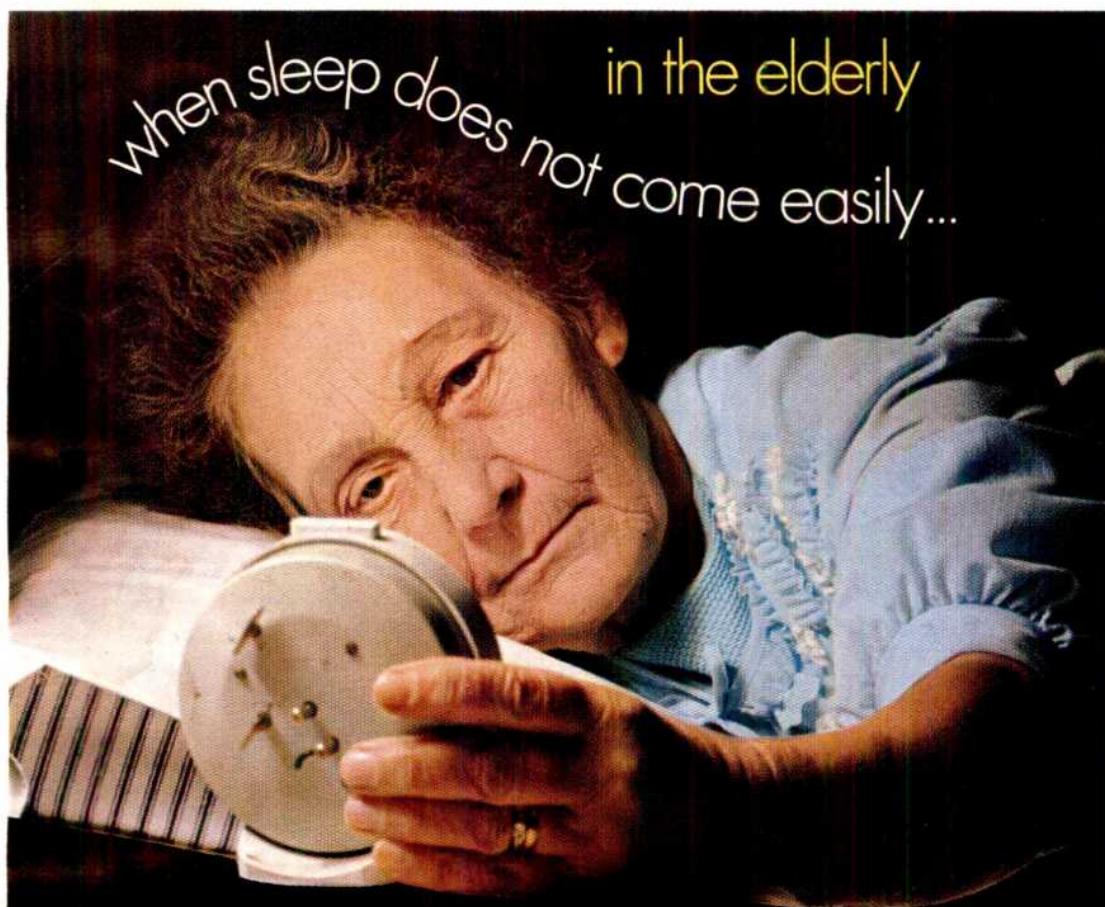
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## The Lionel Penrose Memorial Meeting

In memory of the late Professor Lionel Penrose, who had died in the previous year, a special meeting sponsored by the Mental Deficiency Section of the Royal College of Psychiatrists was held at the Royal Society of Medicine on 13 October 1973. The following seven papers were contributed by speakers who had all at one time or another been co-workers with Professor Penrose. They are preceded here by a Biographical Note specially contributed by another and most recent co-worker, Dr. Alexander Shapiro.

### A Biographical Note

By ALEXANDER SHAPIRO

Lionel Sharples Penrose was born in London on 11 June 1898. He came of Quaker stock and was brought up according to the principles of the Society of Friends. The Quaker education he received and his service in the Friends' Ambulance Train in France during World War I, immediately after leaving school, confirmed him in his compassionate interest in human suffering and in his detestation of war.

After demobilisation he went to Cambridge and began reading mathematics, but later he changed to the Moral Sciences Tripos, for which in addition to mathematics and mathematical logic he also studied psychology.

After gaining a First in his Tripos he spent a year at Cambridge doing research in psychology. He then went to Vienna to continue his studies, and while there he became interested in abnormal psychology and psycho-analysis, had contact with Freud, and underwent a personal training analysis. At that time he contributed a paper on 'Negation' to the *International Journal of Psycho-analysis*. He decided that a qualification in medicine was necessary to enable him to pursue his interests; therefore he returned to Cambridge, and after his pre-clinical studies there went on to St. Thomas's Hospital, qualifying in 1928.

His professional medical life began in psychiatry with a research studentship at the Cardiff City Mental Hospital. His research was

on schizophrenia, and this was the subject of his thesis for the M.D. which he obtained in 1931. His interest was aroused in the aetiology of mental disorder, and in 1931 he was appointed Research Medical Officer at the Royal Eastern Counties Institution at Colchester to study the problems of causation in mental deficiency; and here he carried out the now classical Colchester Survey.

This country can boast of an eminent line of clinicians in the field of mental deficiency, beginning with W. W. Ireland in the last century; and at the time of Penrose's entry into the field there were men of the stature of A. F. Tredgold, R. M. Stewart and F. D. Turner who were at the height of their professional activity, and it was in fact Turner, then Medical Superintendent of the Royal Eastern Counties, who was instrumental in the creation of the research post which Penrose filled so brilliantly.

These men, however, were clinicians, and it fell to Penrose to approach the subject from the point of view of a scientist and biologist; not that his project was devoid of clinical involvement, for he personally examined and studied the 1,280 patients of the hospital as well as over 600 members of their families. In order to carry out his investigations he had to devise not only special methods of examination, such as the Matrices test of non-verbal intelligence, which later became associated with the name of

Raven, but also new statistical methods. Only a man of his background and with his knowledge of mathematics, psychology and biology, as well as medicine, could shoulder such a project. In spite of his meticulous work Penrose was never lost in minutiae, and his theoretical conceptualizations had such an enormous impact on the subject that most of his views on aetiology and classification are now accepted as being axiomatic. He developed his ideas in the book *Mental Defect* which he published in 1933. And while engaged in this task he found time to make important theoretical contributions to genetics, such as the calculation of human mutation rates which he did in relation to epiloia; and at that time he also published the classical paper on the effect of maternal age on the occurrence of Down's syndrome. It is ironic to note that neither these studies nor his previous publications, which ranged in subjects from a study of 'The relation of growth to structure in plants' to the 'Influences of heredity on disease' (for which he won the Buckston Browne Prize of the Harveian Society) were considered to qualify him for Membership of the Royal College of Physicians. This is a fact which he recalled with amusement at the time of his belated election to Honorary Fellowship of the College in 1962. I feel there must be a cautionary message in this episode, which might perhaps be taken to heart by our own College's Court of Electors!

Penrose had an uncanny capacity for becoming aware of important work published anywhere in the world; and, interested by Fölling's report on phenylketonuria in 1934, he was the first to take up the study of the condition in this country. In collaboration with J. H. Quastel he carried on important metabolic studies, and even at that early stage he suggested the use of phenylalanine-free diet in the management of these patients. Unfortunately at that time it was quite impracticable to provide such diets, and the idea of testing them had to be abandoned.

During this period of his work, Penrose, together with Turner, presented evidence to the Inter-Departmental Committee on Sterilization and vigorously opposed proposals that compulsory sterilization should be legalized in this

country as it was elsewhere, particularly in the U.S.A.

The monumental Colchester Survey that brought such new concepts on the aetiology of mental handicap and psychiatric disturbance was completed in 1938 and was published as an M.R.C. Monograph under the title of *A Clinical and Genetic Study of 1280 cases of Mental Defect*.

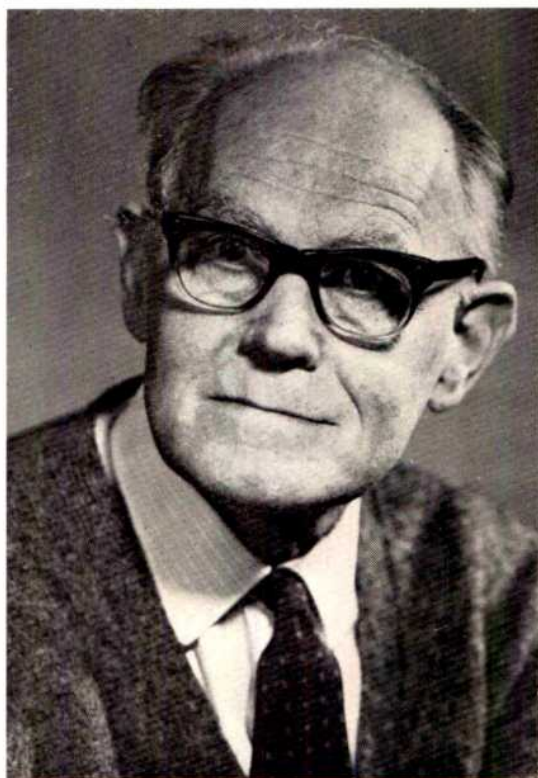
When the Survey was concluded, Penrose accepted the post of Director of Psychiatric Research in Ontario, and went to Canada in 1939, thus returning to general psychiatry in which he had begun his medical career. His work in Canada exhibits the same wide range of interest and activity. He was as interested in assessing results of psychiatric treatment as he was in genetic theory or in aspects of social psychiatry. He carried out a broad-scale investigation on the results of insulin coma and convulsive treatment. The study was made practicable by his capacity to simplify issues whenever necessary, although he was always ready to use the most refined methods of statistical analysis. In this instance he chose to assess the result of treatment by whether or not the patient was still in hospital.

He was one of the first people to show conclusively that shock therapy had hardly any effect in schizophrenia although it had a marked effect in depressive illness. He followed this work up by showing that convulsive therapy was not fundamentally curative but accelerated recovery. This work entailed the analysis of more than 8,000 case histories.

While concerned with this large scale assessment he wrote papers on the effect of the evolution of dominance on certain sex differences in the age of onset in mental illness. At that time, too, he developed non-verbal intelligence tests which he called 'pattern perception tests'. He used similar tests in establishing psychotic profiles and their correlation with normal sexual differences. He was very interested in establishing discriminant functions between psychotic and normal subjects, and in order to do so made an important contribution to the mathematics of statistics.

A further area which attracted his attention and was illuminated by his contribution was the





LIONEL SHARPLES PENROSE. M.A., D.Sc., M.D.  
F.R.C.P., F.R.C.Psych., F.R.S.  
1898-1972

relationship of mental illness to criminal behaviour, and he showed, using published statistics from European, U.S.A. and African sources, that there was inverse correlation between the provision of psychiatric hospital beds and the amount of serious crime.

In 1945 this period of mainly clinical research came to an end with his appointment to the University of London Galton Chair of Eugenics which entailed being the Director of the Galton Laboratory at University College. He was the first medically qualified incumbent of this chair, and under his direction the work of the Laboratory, while continuing in the mathematical and statistical tradition, became more concerned with the application of genetics to medicine.

During this most productive period of his career Penrose concerned himself with a very wide spectrum of subjects—from the development of mathematical methods of statistical discrimination between classes of data to the genetics of breast cancer, and from studies of anticipation and linkage in man to cytogenetics and objective studies of crowd behaviour.

It is impossible here to do justice to the importance of Penrose's scientific contributions and to the broad scope of his work. Professor Harris's monograph, published as a biographical memoir presented to the Royal Society, gives a full bibliography and more extended discussion of the scientific work.

During his tenure of the chair at University College, Penrose exercised a tremendous influence on the shaping of the science of genetics and its application to medicine. It was not only by setting the pace by his wide-ranging and fundamental personal research (he published over 150 papers during this period), but even more by his editorship of the *Annals of Human Genetics* and above all by being a guide, mentor and counsellor to research workers and clinicians alike.

Throughout this period, and in spite of his important theoretical contributions, he never lost interest in clinical psychiatry and particularly in mental deficiency. Soon after taking up his Chair, he established a close working relationship with Harperbury Hospital, and he used to visit the hospital regularly and examine and investigate patients there. Such was his

interest that he served for a number of years on the Harperbury Management Committee, although he was not too keen on committee work. It was in connection with clinical studies in mental deficiency that he developed the method of clinical dermatoglyphics, and he was one of the earliest workers in the new science of cytogenetics.

It is worth mentioning that he had held the opinion that Down's syndrome might be associated with chromosome disturbances long before Tjo and Levan developed their technique for studying human karyotypes. In fact Dr. Mittwoch, working in the Galton Laboratory, did attempt to count the chromosomes in mongolism in the early 1950s but owing to deficiency of cytogenetic techniques at the time he did not succeed in discovering the trisomy.

It is Penrose's concern with the clinical as well as the research aspects of mental deficiency that has made his influence so decisive to the developments in this field. The present scientific and clinical standing of this branch of psychiatry in this country—and this standing is much higher than its detractors realize—is largely due to his precept, encouragement and example. He was always available to discuss clinical and research problems and always ready to see cases—and was full of suggestions and advice to young workers wishing to become involved in the problems of mental deficiency.

His influence was not limited to this country, and workers from all over the world kept in touch with him and came to work with him at the Galton Laboratory.

On retiring from the Galton Chair, Penrose transferred the scene of his activities to the Kennedy-Galton Centre at Harperbury Hospital. It was an event of great significance to us workers in mental handicap to have Penrose within the ambit of the hospital. He was very happy to be working here, as he always considered that only contact with patients could lead to fruitful and meaningful research. In spite of the fact that there was little official encouragement and that most of the funds for the work had to be found by Penrose himself, the Centre continued with very important research work.

Working here, he continued the development



of dermatoglyphic studies with special reference to chromosome anomalies. He also continued with studies of mongolism and, in association with Professor G. F. Smith, wrote his book *Down's Anomaly*. It was during this time that he prepared his paper on mosaicism in mongolism which he read at the time of being presented with the Kennedy Award.

Work on electron microscopy in mental handicap was carried out at the Kennedy-Galton Centre under his direction, and although this area of research has not proved as productive as had been originally hoped, Penrose did describe the finding of crystalline bodies in lymphocytes of patients with mongolism. He continued to the end to be active and to radiate enthusiasm and ideas which would have been surprising in a man half his age. When he died suddenly of a heart attack he was busy planning for the future work and development of the Centre.

This rather superficial and pedestrian account of Penrose's scientific work cannot do justice to the man that he was, nor to his charm, patience and kindness which gave all of us who were privileged to come in contact with him a feeling not only of respect but of affection and gratitude. He was never happier than when he was in contact with mentally handicapped patients whom he treated with the same respect and kindness and courtesy that he accorded to his eminent friends and colleagues. Many parents and relatives of patients remember with gratitude the support and understanding he gave them at diagnostic consultations.

Penrose always bubbled with ideas, and with him serious scientific reflection frequently gave the impression of being an intellectual game. He delighted in paradox and in optical impossibilities, and suggested to the artist Escher quite a number of his designs. He also constructed a number of ingenious mechanical devices to which he always alluded as 'self-replicating animals'. He built them to illustrate a possible mechanism of replication of the DNA molecule.

He constructed a slide rule for evaluating the dermatoglyphic and other clinical data to help the diagnosis of Down's syndrome and other conditions. Those of us who were privileged to hear his paper on the Porcupine Man remember with pleasure the puckish and iconoclastic delight which he took in demolishing the centuries-long genetic misconception.

In his lighter moments he enjoyed music, chess and the debate on Shakespearean authorship. Although perhaps not as well endowed in the field of art as he was in the field of science, he still had considerable talents both as a musician and as an artist, and these activities gave him a lot of personal pleasure. This lighter aspect of his personality was balanced by a great concern for humanity, and he approached broader human problems with the same scientific methodology which characterized his scientific work. He was, for example, actively involved in discussion on the supposed decline in intelligence, and he wrote several papers putting forward mathematical models to show that there were counteracting factors to keep the level of human intelligence stable, a thesis which was amply supported by studies of intelligence of schoolchildren in Scotland.

He was also a very active founder member of the Medical Association for the Prevention of War. This activity, however, was not purely an abstract and intellectual concern, for he and his wife, Dr. Margaret Penrose, extended their generous hospitality to a large number of refugees from oppression and persecution whom they befriended and helped with characteristic modesty and selflessness.

British psychiatry, and indeed world science, is the poorer for its loss of a man whose scientific stature was only equalled by his greatness as a human being.

#### ACKNOWLEDGEMENTS

My particularly warm thanks are due to Miss Helen Lang Brown for her help with biographical and scientific detail. I would also like to acknowledge my indebtedness to Professor Harris's bibliographical memoir.

Alexander Shapiro, M.D., F.R.C.Psych., *Consultant Psychiatrist, Harperbury Hospital, Harper Lane, nr. St. Albans, Herts*

## The Long-Term Genetical Effects of Recent Advances in the Treatment and Prevention of Inherited Disease

By G. R. FRASER

Even though I do not propose to discuss the work of Professor Penrose directly, I should like to express my appreciation to the organizers of this symposium in his memory for giving me an opportunity to pay tribute to a man whom I regard as having been both my teacher and my friend.

Some concern has been expressed, though, I should hasten to add, never by Professor Penrose himself, about a possible deterioration of the genetical endowment of our species because of treatment and prevention of inherited disease, especially those types which are of simple Mendelian determination.

The basis of this concern can be illustrated by a few examples. Retinoblastoma is a malignant tumour of the eyes which arises in early infancy and if untreated rapidly leads to death. During the past century many lives of affected children have been saved by surgery, and the recent introduction of radiotherapy in treatment has even led to the preservation of some eyesight in a proportion of cases. Thus these children have survived to reproduce, and it has subsequently become apparent that the bilateral form of the disease is usually inherited in an autosomal dominant manner. The conclusion is inescapable that in this case treatment has led directly in the next generation to an increase in the birth incidence and the population prevalence of the condition.

Similar reasoning can be applied to X-linked recessive disease. Thus, improvements in the treatment of haemophilia, leading to increased survival of sufferers to the age of procreation, will inevitably lead in the next generation but one to an increase in the number of affected grandsons of the treated patients and hence to an increased birth incidence and population prevalence. In the case of an autosomal recessive

disease, such as galactosaemia, the consequences of improved treatment will be similar but more remote in their deleterious effects, in that it may take many generations for alleles transmitted by a homozygous affected individual whose life has been saved in childhood by treatment to give rise to a further victim who would not have been born but for the treatment given to his ancestors.

In addition to advances in treatment, much emphasis in recent years has been laid on the possibilities of prevention of Mendelian disease. I do not propose to discuss here the ethical aspects of the methods which we have at our disposal for this prevention; essentially they involve intra-uterine diagnosis and subsequent abortion of affected fetuses. I personally feel that this is only a transient phase and that better methods of achieving the same goals will become available in the not too distant future, perhaps by selection at the level of the gamete, especially the sperm rather than the zygote; but this again is a topic which is somewhat outside the purview of this discussion.

In association with the transient nature of this present phase in our attitudes to these problems, an antithesis is apparent between treatment and prevention. This does not, of course, apply to the more conventional aspects of preventive medicine such as, for example, the early detection of tuberculosis by X-ray screening. In such a case the object of the diagnostic procedure is to improve treatment and not to do away with the patient. We may yet reach this stage with intra-uterine diagnosis also, as indeed is already the case with rhesus incompatibility; but in the situation which obtains at present I have deliberately chosen, as examples of Mendelian diseases in which prevention of birth by abortion may be appropriate, those which are untreatable

and which lead to a great deal of suffering both for the infant during his limited life span and for his family.

For example, Tay-Sachs disease may be diagnosed *in utero*, and if such diagnosis is followed by abortion this will undoubtedly have the effect of encouraging reproductive compensation, especially since subsequent pregnancies in the family concerned can be monitored in the same way. The normal child replacing the affected one will be a heterozygote in two cases out of three and thus will pass on the deleterious allele to future generations; the affected child, had he been born, would, of course, not have done so.

The same kind of reasoning applies in the case of X-linked recessive disease. Except in the rare instances, such as that of Lesch-Nyhan syndrome, in which the diagnosis of genotype as well as of sex can be made ante-natally, a policy has been pursued of aborting male foetuses when the mother has been identified as a heterozygous carrier. This has been done, for example, in the case of muscular dystrophy of Duchenne type. The application of such a strategy leads on the average to the birth of an additional heterozygous female for each affected male aborted; once again this will clearly increase the population frequency of the deleterious gene in the next and subsequent generations.

It should be noted that such a strategy would have a pronounced eugenic effect if it could be applied to autosomal dominant diseases. To revert to the example of retinoblastoma, affected individuals will, of course, all be identified long before they reach the reproductive period. If the disease could be diagnosed by intra-uterine techniques, they could procreate without incurring the danger of having affected offspring, thus counteracting the potential dysgenic effects of the treatment which has preserved their lives. Unfortunately, however, dominant diseases as a class are generally of a type that is not yet amenable to ante-natal detection, but this situation may change in the future, especially with improvements in our knowledge of the linkage map of Man.

Some of the quantitative aspects of the effects of the advances in treatment and prevention

which have been discussed are set out in Tables I to III. At the present time, access to facilities of this type is available only to a minute proportion of the human population; but this may change in the future, and the potential dysgenic effects have been calculated in these tables on the worst possible assumption that the entire population is involved.

Table I shows the effects of treatment, but the time scale on which these changes occur must be borne in mind. The doubling of the disease incidence will take only a very few generations in the case of an autosomal dominant disease, such as retinoblastoma, but the rate of increase will be considerably slower in X-linked recessive diseases and very slow indeed for autosomal recessive ones.

Table II shows the long-term effects of prevention of an autosomal recessive disease by a strategy of ante-natal diagnosis and selective abortion. It should be noted again that the rate of increase in frequency of the deleterious allele is very slow, and that the final equilibrium will not be reached for very many generations. Furthermore, the extent of the increase depends substantially on  $p$ , the proportion of pregnancies in the population which can be monitored in this way. At the present time, this strategy is usually applicable only in the retrospective situation when the heterozygosity of the two parents has been detected because of the previous birth of an affected child. However, attempts at pre-marital or pre-reproductive

TABLE I  
*Long-term dysgenic effects of treatment*

Let initial fertility of affected persons be  $f_0$ , say zero.  
Let fertility after treatment be  $f_1$ , say 0.5.

Let  $\frac{\text{final incidence of disease}}{\text{initial incidence}}$  be X

| Disease                                                  | X                                        |
|----------------------------------------------------------|------------------------------------------|
| Autosomal dominant maintained by mutation                | $\frac{1-f_0}{1-f_1} = 2$                |
| Sex-linked recessive maintained by mutation              | $\frac{1-f_0}{1-f_1} = 2$                |
| Autosomal recessive maintained by mutation               | $\frac{1-f_0}{1-f_1} = 2$                |
| Autosomal recessive maintained by heterozygote advantage | $\left[\frac{1-f_0}{1-f_1}\right]^2 = 4$ |

It should be noted that X will increase as  $f_1$  increases and will decrease as  $f_0$  decreases.

TABLE II

*Long-term effects of prevention of autosomal recessive disease by selective abortion*

Let fertility of affected persons be zero.

With complete reproductive compensation the situation is formally equivalent to Table I with values of  $f_0$  and  $f_1$  of zero and  $1/3$ . Where selective abortion and hence reproductive compensation only involves a proportion of  $p$  of affected foetuses the appropriate value of  $f_1$  becomes  $p/3$ .

Thus the values of  $\frac{\text{final gene frequency}}{\text{initial gene frequency}}$  are as follows:

| Balancing mechanism    | .. | .. | p 1/8* | 1/4  | 1/2  | 3/4  | 1 (complete reproductive compensation) |
|------------------------|----|----|--------|------|------|------|----------------------------------------|
| Mutation               | .. | .. | 1.02   | 1.03 | 1.10 | 1.15 | 1.22                                   |
| Heterozygote advantage | .. | .. | 1.04   | 1.09 | 1.20 | 1.33 | 1.50                                   |

\* This value of  $p$  is appropriate if all counselling is retrospective (i.e. occurs after the birth of an affected child) assuming a standard family size of two children.

screening are being made in the case of certain diseases in specific ethnic groups in which the deleterious allele responsible has reached a high frequency. Examples of conditions of this type are Tay-Sachs disease in Ashkenazic Jewish communities and sickle-cell anaemia among Greeks and among blacks in the U.S.A. and elsewhere. Apart from a few such conditions, however, there are serious technical limitations to mass population screening of this type, in that detection of heterozygosity is very difficult, or even impossible, in the majority of autosomal recessive diseases; but this will change, and the introduction of prospective genetical counselling based on pre-reproductive screening of couples will become of increasing importance.

It should be noted that, although the population frequencies of deleterious alleles will rise

in the way set out in Table II, the birth incidences of the autosomal recessive diseases for which they are responsible in homozygous form will not. The ratio of the final to the initial

incidences is in fact expected to be  $\frac{1-p}{(1-p/3)}$

when mutation is the balancing mechanism, and  $\frac{1-p}{(1-p/3)^2}$  when heterozygote advantage is involved; in both cases this ratio is less than unity

as long as  $p$  is greater than zero, i.e. as long as application of the strategy continues.

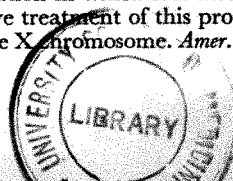
Table III shows the long-term effects of a strategy involving selective abortion in the case of a lethal X-linked recessive disease such as Duchenne's muscular dystrophy. Once again, there are considerable differences between

TABLE III

*Long-term effects of prevention of X-linked disease by selective abortion*

| Diagnosis of heterozygosity in mother   |    |    |    | Prospective |      | Retrospective without reproductive compensation |      | Retrospective with reproductive compensation |      |
|-----------------------------------------|----|----|----|-------------|------|-------------------------------------------------|------|----------------------------------------------|------|
| Method of selective abortion            | .. | .. | .. | X           | Y    | X                                               | Y    | X                                            | Y    |
| All males                               | .. | .. | .. | 0.33        | *    | 1                                               | 1.14 | 1.32                                         | 1.90 |
| Affected males                          | .. | .. | .. | 0.33        | 1.50 | 0.94                                            | 1.04 | 0.90                                         | 1.25 |
| Affected males and heterozygous females | .. | .. | .. | 0.33        | 0.50 | 0.85                                            | 0.89 | 0.67                                         | 0.74 |

\* Increases by 50 per cent of original value each generation. Ratios of final to initial equilibrium incidences at birth of males affected with X-linked recessive diseases (X) and of prevalence of female heterozygotes (Y) under various programmes of ante-natal diagnosis and selective abortion. It is assumed that each couple has two children except in the case with reproductive compensation in which it is assumed that two normal children are born in addition to any affected males. An extensive treatment of this problem is to be found in Fraser, G. R. (1972) Selection abortion, gametic selection, and the X chromosome. *Amer. J. hum. Genet.*, 24, 359.



retrospective and prospective application of the strategy. The prospective case is marked by a substantial reduction in the birth incidence of the disease to a level maintained by mutation, while the population prevalence of female heterozygotes increases slowly (but to a greater extent than in the retrospective case) if only males are aborted.

In the case of a condition such as Lesch-Nyhan syndrome, both the genotype and the sex of the foetus can be determined after amniocentesis, and therefore only affected males need be aborted. A rather delicate problem arises if the foetus is identified as a female of heterozygous genotype. If the pregnancy is allowed to go to full term, the child will be normal but will have the same problems as the parents when she reaches reproductive age. The response to such a diagnosis will vary from family to family, and for the most part parents will wish such a pregnancy to continue; however the paradox should be noted that male sufferers from haemophilia, if they have access to ante-natal diagnosis, will often choose not to have daughters and thus avoid the risk of having affected grandsons. Most of these ethical and moral issues in the field of X-linked disease will become far less acute if it becomes possible to separate X and Y chromosome-bearing sperm, with retention of their fertilizing powers. At such a time, heterozygous females will be able to have daughters and affected males to have sons without any necessity for recourse to selective abortion.

The discussion thus far has been limited to individually rare Mendelian diseases, although in their totality these affect a not insignificant proportion of our species. The same kinds of arguments apply, however, to common diseases also. Diabetes, tuberculosis and schizophrenia are examples of such diseases which are thought to have a complex genetical background. When we improve the lot of sufferers to such an extent that their fertility increases, we are again causing the same type of dysgenic effect, the main difference being that it is more difficult to express the deterioration in simple quantitative terms. The concept of deterioration is being used in a somewhat narrow sense, however. We cannot be sure that alleles contributing to

enhanced susceptibility to diabetes, tuberculosis or schizophrenia are not at the same time actually beneficial in other ways which we do not understand, and the same uncertainty applies to heterozygosity for alleles causing phenylketonuria or galactosaemia in homozygous form.

In any case, we cannot withhold medical treatment for common diseases because of such considerations, and a deliberate return in economically developed societies to a situation where tuberculosis carried off thousands of children and young adults is inconceivable.

Exactly the same reasoning applies to the treatment of cases of retinoblastoma, of haemophilia or of galactosaemia. Again, from the point of view of prevention, a young woman who wishes to marry and has seen the tragedy of Duchenne's muscular dystrophy in a brother has the right to ask for her own immediate problems and those of her husband and potential children to be considered, rather than the problems of future generations, when in any case much better solutions will undoubtedly be available. Thus, in my opinion, criteria arising from the normal practice of medicine preclude any refusal or hesitation in applying current techniques of treatment and prevention to Mendelian disease.

We have seen that the ultimate consequences of such techniques under the worst possible assumptions are not alarming, especially taking into account the long period of time over which these effects are likely to occur. I should like now to indicate that the potential impact of these techniques will be further modified because we are going through a phase of profound reappraisal of our thinking and our policies towards human procreation as a whole. This may well lead to such important changes that the effects of the prevention and treatment of hereditary disease will be very minor in comparison. We have no guidance from the philosophers and the moralists of the past relevant to this general reappraisal, for this is essentially a problem of our own century. In our consideration of this problem, quantitative aspects of the prevention of the sheer overproduction of human biomass which is threatening the foundations of our society are inseparable



from the qualitative aspects we have been discussing. In this connection, we must presuppose, if our society as we know it at present is to survive at all, a greater degree of individual responsibility towards procreation.

I propose now to examine the dysgenic consequences of the various aspects of treatment and prevention we have been considering within this wider context. Table IV shows the effects of some of the changes which are likely to occur with respect to Mendelian disease and to chromosomal aberrations. The pattern of trans-

mission of some chromosomal aberrations is that of regular autosomal dominant inheritance, whereas translocations are transmitted to offspring through healthy carrier parents, more often the mother, thus simulating dominant inheritance with reduced penetrance. It is quite possible that a number of conditions thought to be inherited in a dominant manner are in fact due to small chromosomal anomalies, and more examples of such conditions are likely to be detected as the newer techniques of karyotyping are increasingly applied.

TABLE IV

*Dysgenic and eugenic implications of present and some future possibilities of prevention and of treatment, and of some technological and sociological changes affecting reproductive patterns, in the case of diseases determined by Mendelian inheritance or by chromosomal aberrations (D = dysgenic; E = eugenic)*

|                                                                              | Autosomal<br>dominant<br>inheritance | Autosomal<br>recessive<br>inheritance | X-linked<br>recessive<br>inheritance | Chromosomal<br>aberration    |
|------------------------------------------------------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|------------------------------|
| <b>Treatment</b>                                                             |                                      |                                       |                                      |                              |
| Increased fertility .. .. .                                                  | D                                    | D                                     | D                                    | D                            |
| <b>Prevention</b>                                                            |                                      |                                       |                                      |                              |
| Avoidance of marriage between heterozygotes by pre-marital screening ..      |                                      | D                                     |                                      |                              |
| Counselling leading to reproductive restraint .. .. .                        | E                                    | E                                     | E                                    | E                            |
| Early diagnosis .. .. .                                                      | E                                    |                                       |                                      |                              |
| Improvements in karyotyping .. ..                                            |                                      |                                       |                                      | E                            |
| Improvements in heterozygote detection                                       |                                      | E                                     | E                                    |                              |
| Artificial insemination by donor ..                                          | E <sup>1</sup>                       | E <sup>2</sup>                        | E <sup>1</sup>                       | E <sup>1</sup>               |
| Ante-natal diagnosis and selective abortion of affected foetuses .. ..       | E                                    | D                                     | D                                    | D-translocations<br>E-others |
| Extension of abortion to heterozygotes or carriers .. .. .                   |                                      | E???                                  | E?                                   | E?                           |
| Artificial insemination by husband using X-chromosome bearing sperm (future) |                                      |                                       | D                                    |                              |
| Genotypic gametic selection (future) ..                                      | E                                    | E <sup>2</sup>                        | E                                    | E                            |
| <b>Others</b>                                                                |                                      |                                       |                                      |                              |
| Break-up of isolates and increase in outbreeding .. .. .                     |                                      | D <sup>4</sup>                        |                                      |                              |
| Reduction of heterozygote advantage ..                                       |                                      | E                                     | E                                    |                              |
| Lowering of parental age at reproduction                                     | E                                    | E                                     | E                                    | E                            |
| Increase in mutation rate due to radiation and chemical agents .. .. .       | D                                    | D                                     | D                                    | D                            |

Question marks indicate that procedures are of doubtful applicability.

<sup>1</sup> Where the father is affected or a carrier.

<sup>2</sup> The eugenic effect is limited in that the selected gametes may carry deleterious alleles for autosomal recessive diseases other than those who frequency the procedure is designed to control.

<sup>3</sup> This dysgenic effect may be compensated to some extent by enhancement of hybrid vigour determined by complex interactions of alleles at many loci at which the average level of heterozygosity will increase.

Table IV shows very complex interactions, with dysgenic effects such as those we have discussed being compensated by eugenic effects of other changes in reproductive patterns. Among procedures connected with counselling, reproductive restraint, within a general framework of an attitude of increased responsibility and of improvements in diagnostic techniques—whether applied to the early detection of diseases such as Huntington's chorea or to the identification of heterozygotes or of carriers of chromosomal anomalies—will have such eugenic effects; so will artificial insemination by a donor, which is, pragmatically at least, an excellent solution when the husband is affected by an autosomal or X-linked condition. It should be noted that if pre-marital screening for heterozygosity is followed by a change in choice of marriage partners rather than by reproductive restraint, the effect will tend to be dysgenic rather than eugenic, since the carriers in question will still reproduce but elimination of deleterious alleles through the births of affected children will be prevented.

The possible extension of selective abortion to healthy heterozygotes has already been discussed with respect to female carriers for X-linked diseases. The situation is much the same with respect to fetuses with balanced chromosomal translocations, and in both cases it is to be expected that the families concerned will allow the pregnancy to remain undisturbed after the diagnosis is made. The propriety of termination is, of course, much more questionable in the case of fetuses heterozygous for autosomal recessive diseases, since we are all in fact probably carrying several such alleles; so this is not a method which is applicable to the elimination of these alleles.

I have already said that I believe the present phase in our technology of prevention and treatment of Mendelian disease is a transient one and that better methods will become available. I would not venture a detailed guess as to what these will be; after all, Archimedes could not have been expected to foresee the details of the Apollo space flights, and we are talking about an equivalent span of generations. However, the legend of Daedalus and his son Icarus clearly shows that the ancient Greeks

did envisage, in a very general way, the possibilities of mechanically assisted flight and even of space travel, and the suggestions as to future techniques contained in Table IV are also to be interpreted as tentative and non-specific prognostications.

A beginning has already been made on the methodology of separation of X- and Y-chromosome-bearing sperm with retention of their fertilizing potential; and, as I have already pointed out, this technique, when available, will allow the problem of prevention in the case of X-linked disease to be approached in a far less traumatic manner, and one also less likely to offend ethical susceptibilities. Possibly, other developments may be envisaged in the more remote future for separation of gametes, especially sperm, by actual genotype at single loci, with obvious eugenic implications.

The changes that are taking place in reproductive patterns and have relevance to the questions under discussion are not confined to those which result from our efforts in the application of genetical counselling and of these ancillary procedures, whether currently available or only potentially so. In the bottom part of Table IV are listed some of these other changes. Thus, the break-up of isolates and consequent increase in out-breeding will have the same dysgenic effects in the case of autosomal recessive disease as avoidance of marriages between heterozygotes because of genetical counselling. On the other hand, reduction of heterozygote advantage will have an eugenic effect; thus, for example, the elimination of malaria may be expected to lead to a reduction of the frequency of the allele giving rise to sickle-cell haemoglobin, since the heterozygote will no longer be favoured as far as mortality and morbidity arising from this disease are concerned.

A very important effect is likely to result from the reduction in the average age at marriage and reproduction which has been taking place and is continuing in Western society. This may be expected to lead to a reduction in the birth incidences both of certain chromosomal anomalies, such as Down's syndrome, which are strongly influenced by increasing maternal age, and of diseases caused



by mutations which increase in incidence with paternal age. This eugenic effect will unfortunately be counterbalanced to some extent by increases in the mutation rate both at the gene and possibly at the chromosomal level due to pollution of the environment by the radiation and chemical agents which are the inescapable by-products of our technological civilization.

Of course, this discussion by no means exhausts the possibilities of the calculations and projections which could be made, and quite a substantial body of literature on these topics is in existence. I have only tried to indicate in a general way that at the present stage of our scientific and moral uncertainties concerning our future directions these are not among the major problems facing our species, even if we could make any accurate predictions about the effects of what we are doing. We have seen that, in fact, the dysgenic and eugenic results of recent changes in our attitudes towards our procreation, stimulated in part by advances in genetical counselling and the application of ancillary procedures, interact in a very complex manner, and the overall result is extremely difficult to foresee.

I personally do not believe, therefore, that improvements in the methodology of control of Mendelian disease, whether by therapy, by selective abortion, by better diagnosis, by gametic selection if and when available, or by detection of heterozygotes even if applied on a large scale, will make a significant difference to the tremendous reservoir of genetical heterogeneity which characterizes our species and which is, at one and the same time, such a blessing and such a curse. I would go further and make the same prediction even subsuming the supposed dysgenic effects of other types of medical advances involving the therapy of common diseases of complex genetical causation, such as diabetes, tuberculosis and schizophrenia. The gene pool of our species is being agitated by particularly violent currents at the present time, and in comparison the changes under discussion are causing mere ripples.

There are, of course, contrary opinions. Thus, one commentator was overcome by gloom as he contemplated 'the man of tomorrow beginning his day by adjusting his spectacles and his

hearing aid, inserting his false teeth, taking an allergy injection in one arm and an insulin injection in the other, and topping off his preparations for life by taking a tranquilizing pill'.\* I have made it abundantly clear that I do not agree with this vision of the future. In addition, I feel that, rather than concerning ourselves unduly with these problematic and uncertain long-term effects of our improved systems of medical care, we would be serving future generations better by trying to cope more wisely than we are doing at the moment with more pressing short-term problems such as pollution, famine, war and over-population. In fact, of the four horsemen of the Apocalypse, the only one we have succeeded in deviating somewhat from his course is pestilence, in connection with advances in the field of infectious disease, and even this is a victory whose fruits we must jealously guard.

If we can manage to bequeath to future generations a world in which social and political conditions are suitable for future technological progress, preferably organized in a more rational manner than we have been able to achieve thus far, then I for one feel that what we are doing to improve the lot of sufferers from genetically determined diseases or the lot of their families will not cause our descendants insuperable or even particularly difficult problems. If we cannot bequeath such a world to them, then these types of discussions are futile and irrelevant, for they will be overtaken by events involving catastrophes of a totally different order of magnitude.

I hope that Professor Penrose might have agreed with these conclusions. He was a very humane person and very tolerant of the frailties and defects to which our species is subject. The aphorism of Terence is particularly appropriate in defining his attitude—'*Homo sum et nihil humanum mihi alienum puto*'.† I believe that he would understand our present dilemmas and those of our patients very well. He would have sympathized equally with the desire of a mother who had previously given

\* Glass, B. (1972) Human heredity and ethical problems. *Perspect. Biol. Med.*, 237.

† I am a man; there is nothing touching Man that is not my concern.

birth to a mentally defective child not to bear others, even at the cost of an abortion, and with the mentally deficient children who will undoubtedly continue to be born despite any and every advance in prevention. These unfortunates he considered very much as part of the human condition, and he would certainly have approved of any steps taken to make their lot more tolerable and pleasant by treatment, even though in some cases this might lead to their procreation and to the spread of the deleterious alleles they carry to future generations.

Finally, in addition to his specialized interests, Professor Penrose was very much preoccupied by the larger issues which have been very

briefly and peripherally mentioned in this presentation, such as social and economic injustice and hardship, and the futility of war. I feel that he would have agreed that the resolution of these problems should be given high short-term priority and that success in these endeavours would guarantee our descendants sufficient technological resources fully to counteract the potentially deleterious long-term effects of our current attempts to mitigate the cruel and previously inexorable workings of natural selection by the application of medical and biological advances to the treatment and prevention of inherited diseases.

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## The Development of Penrose's Ideas in Genetics and Psychiatry

By HARRY HARRIS

After I had agreed to give this talk about Lionel Penrose's contributions to genetics and mental deficiency I realized what an impossible task I had undertaken. His research career in these areas spanned a period of more than forty years, during the whole of which he was making important and significant contributions on an extraordinarily diverse range of topics. Furthermore, during this period both of these subjects advanced from an almost pre-scientific infantile state to rigorous and critical disciplines, and Penrose's work played no small part in this development.

Since it is clearly not practicable to present a proper assessment of Penrose's contributions in the time available, I decided it would be best if I confined myself to giving some account of the early part of his career, because the work he accomplished at that time is much less well known than his later work, though it was certainly no less significant.

According to Penrose himself, his interest in psychiatry began very suddenly when during the 1914-1918 war he happened to hear a lecture on Freud's theory of dreams. At that time he was serving in the Friends' Ambulance Train in France which he had joined after leaving school. He was quite astonished to find that some fairly reasonable explanation could be given for the apparently disordered sequences of ideas which occur in dreams, and he decided that if possible when he went to university he would try to study this exciting subject, instead of mathematics as he had previously intended. However, when the war ended and he went to Cambridge he was disappointed to find that psychoanalysis had not penetrated the University curriculum. The nearest possibility was psychology, and this was linked to philosophy and mathematical logic in the cumbersome academic

configuration then known as the Moral Sciences Tripos. As it turned out, he was not very impressed with the courses, but nevertheless he got a First and then spent a year working in F. C. Bartlett's experimental psychology laboratory. After this he went to Vienna and started some work in Bühler's laboratory on memory and perception. But his interest in psychoanalysis and abnormal psychology was recaptured by the Viennese masters, and he decided that this was really the field to work in. For this he felt he needed a medical qualification, so he returned to Cambridge to do the necessary pre-clinical courses and then moved to St. Thomas's in London for his clinical work.

He qualified in medicine in 1928 and shortly after obtained a research studentship to work at the Cardiff City Mental Hospital. Here he seems to have been principally interested in schizophrenia, and in particular in a very elderly patient who was intellectually well preserved but who had a history of psychosis going back for fifty years and who had built up an extraordinary system of delusions; these Penrose proceeded to analyse in considerable detail (Penrose, 1931). This work formed the subject of his thesis for the M.D.

Then in 1931 he moved to Colchester to become research medical officer at the Royal Eastern Counties Institution for mental defectives. This was the starting point of his research career in human genetics and mental deficiency which he was to pursue for the rest of his life. In retrospect it appears as a quite sudden and unanticipated shift in direction. He was now in his early thirties and until then does not seem to have been especially interested in either genetics or mental deficiency. They would hardly appear to be areas to which an enthusiasm for psychoanalysis would have led him.

Also, the conventional career prospects intrinsic to such a move were certainly not to his taste. The appointment was a new one, but it was originally hoped that the successful candidate would eventually prove suitable to succeed the then Medical Superintendent as head of the institution when he retired. Penrose nearly missed the job altogether because at one of the interviews he disparagingly referred to the work of a medical superintendent of a mental deficiency institution as no more than 'hotel-keeping' and certainly not among his own ambitions.

The post had in fact been sponsored by the Medical Research Council because it had begun to be felt at that time that research into mental deficiency needed to be encouraged. Mental deficiency was the Cinderella of the public health services. Although it was clearly recognized as a major social problem there was very little firm scientific knowledge about its nature or causation. It was not a subject which attracted young medical research workers, perhaps because it seemed too far removed from the mainstream of general medical science, or indeed from the mainstream of psychiatry.

To Penrose the apparent disadvantages and difficulties in entering this line of work were probably among its main attractions. He was never one to follow the herd, and its lack of popularity among the avant-garde is perhaps what encouraged him most. Here was so much uncharted territory waiting to be explored in depth. He seems to have perceived from the beginning that if the subject was approached quite objectively and without preconceptions, and if a careful and systematic collection of facts about a large array of patients of all grades and types and about their families could be collected, then there would be for the first time a firm base on which a critical analysis of possible causal factors could be built.

#### THE COLCHESTER SURVEY

So in 1931 he started work on the famous Colchester survey. It took seven years to complete, and was a detailed clinical and genetic study of 1,280 patients in the Royal Eastern Counties Institution. The patients were of all grades and types varying from idiots and

imbeciles at one extreme to some at the other extreme who appeared to have IQs which would be regarded as falling within the normal range, but who had been admitted to the institution certified as feeble-minded because of anti-social or difficult behaviour. The survey represented an enormous amount of work, since, apart from the detailed clinical study and psychological assessment of the patients themselves, many thousands of their immediate relatives were investigated. This was a formidable undertaking, as the family of every case was visited on the average two or three times by Penrose himself or by one of his very small group of assistants. An extraordinary amount of detailed information was collected and analysed, and the M.R.C. report on this work eventually published in 1938 is a mine of information and still remains a valuable primary source about aspects of mental defect (Penrose, 1938a).

Certain important conclusions of a general nature emerged with great clarity. Although to-day they are accepted without question and appear to be little more than statements of the obvious, they were very significant findings at the time. It was shown, for example, that there is no sharp dividing line between mental deficiency and the so-called normal state; that what is called mental defect represents a highly heterogeneous series of conditions; and that there are a multiplicity of causes both genetic and environmental which can be involved in its occurrence.

A further result of general importance concerned the overall incidence of mental defect of different grades among the immediate relatives of affected patients. In the total data the incidence of defect among parents and sibs of the patients was estimated to be as high as 7-9 per cent. This exceeded the estimate for the population in general by 6-8 per cent. However, mental retardation of some degree was found to be more frequent among the parents and sibs of the higher-grade feeble-minded patients than among those of the idiots, though the defects found in the families of idiots were more likely to be of the nature of idiocy than of feeble-mindedness. Thus, on the one hand, there was a general tendency for the sibs of idiots to be more intelligent than



the sibs of higher grade patients, on the other hand a larger proportion of idiots was found among the sibs of idiots than among the sibs of any other grade. This at first sight paradoxical result pointed the way to the further analysis of these conditions in terms of their genetical heterogeneity.

It is not possible to discuss here all the many different problems which emerged from the Colchester survey and which were studied. But certain of them should be mentioned because of the special place they have had in the subsequent development of human genetics and mental deficiency.

#### EPILOIA

The work on epiloia or tuberous sclerosis (Gunther and Penrose, 1935), for example, is of particular interest because it led to the first estimate by the so-called direct method of the mutation rate of a gene in man. The argument used was a very simple one. From a detailed family investigation of a series of patients with tuberous sclerosis Penrose was able to show that this condition, despite its considerable range of clinical expression, could almost certainly be attributed to the effects of mutated form of a single gene, for which the affected patients were heterozygous. It was also shown that the abnormal gene present in approximately one quarter to one half of the series of patients who were the *propositi* for the family study must have been the product of a fresh mutation which had occurred in the gonads of one or other of their parents. Now the incidence of tuberous sclerosis in institutions for the mentally defective was at that time about 1 in 300; and the incidence of mental defect in the general population was thought to be about 1 per cent. So the incidence of tuberous sclerosis in the population as a whole was presumably about 1 in 30,000. If, as suggested by the family studies, one quarter to one half of such cases were due to fresh mutations, the mutation rate per individual per generation would be between 1 in 120,000 and 1 in 60,000; or, as it is more usually expressed, between about 0.8 and  $0.4 \times 10^{-5}$  per gene per generation. Obviously the estimate could only be considered a rough and approximate one, but the order of magnitude was the

important thing. At about the same time J. B. S. Haldane obtained an approximate estimate for the mutation rate to the gene determining haemophilia, using the so-called indirect method. They published their results jointly in *Nature*, and this paper was the starting point for much subsequent work on mutation rates in man (Penrose and Haldane, 1935). It was certainly quite a step forward for human genetics in 1935.

#### PHENYLKETONURIA

Phenylketonuria was another topic on which Penrose worked at Colchester. Fölling's discovery of large amounts of phenylketonuric acid in the urine of certain mentally defective patients was reported in 1934. This was the first clear example of a so-called 'inborn error or metabolism' identified since the classical work of A. E. Garrod at the beginning of the century. Penrose immediately appreciated the potential significance of the discovery both for human genetics and for mental deficiency, and he set out to search for further examples of the condition among his Colchester patients. After testing the urine of more than 500 of them he picked up his first case, a 19-year-old male idiot. Subsequently further patients were identified, and family studies supported the idea that the condition was inherited as a Mendelian recessive. Then, working with the biochemist J. H. Quastel, Penrose proceeded to carry out what must have been one of the earliest metabolic studies on the condition. This consisted of feeding various substances such as phenylalanine, tyrosine and phenylpyruvic acid itself to the patients and to controls, and measuring the output of phenylpyruvic acid in the urine. Some interesting observations were made, but it was not possible to get very far, because the biochemical methods then available to them were too limited. However, it is of interest that the name 'phenylketonuria' suggested by Quastel was used in their publication in place of the earlier name 'phenylpyruvic oligophrenia' and has since become universally accepted (Penrose and Quastel, 1937).

Even at this early date Penrose saw that it might eventually prove possible to treat the condition by administering a phenylalanine-

restricted diet. One of the first diets he tried consisted of fruit, sugar and olive oil, with vitamins added, and very soon the phenylpyruvic acid disappeared from the urine. But trouble started after about two weeks when the patient began to lose weight because of the poor nutritional content of the diet, and the excretion of phenylpyruvic acid began again. Penrose consulted F. Gowland Hopkins at Cambridge about the possibility of constructing a nutritionally adequate phenylalanine-restricted diet; but Hopkins estimated that it would cost £1,000 to produce sufficient for one patient for one week. So the matter had to rest.

#### MONGOLISM

From his earliest days at Colchester, Penrose was fascinated by the problem of mongolism, and he was to study it from one point of view or another for the rest of his life.

At that time nothing was understood about the causation of this relatively common condition. It had, however, long been known that mongols were frequently born to elderly parents, frequently towards the end of a family, often being the youngest child. However, the relative importance of maternal age, paternal age and birth rank as aetiological factors was quite obscure, since maternal age and paternal age tend to be highly correlated, and the later birth positions in a family necessarily occur at higher parental ages. Penrose set out to try to disentangle these effects.

He first considered the relative influence of maternal age and paternal age, and devised an original and very ingenious approach (Penrose, 1933). He had by this time—1933—collected accurate data on parental ages in 150 families each containing a mongol child. There were in all 154 mongol and 573 normal children. He found, as expected, that there was a highly significant correlation between maternal age and the birth of a mongol child, and also between paternal age and the birth of a mongol. He then calculated for the whole data the mean age of the mothers and the mean age of the fathers at the birth of the mongol children and at the birth of the normal children. He also

calculated for the set of families the regression of paternal age on maternal age and similarly the regression of maternal age on paternal age. Using these regressions he could then estimate the expected mean paternal age for the mongols and the normals, assuming that the maternal ages were fixed. Similarly he could estimate the expected mean maternal ages assuming that the paternal age was fixed. The result was clear-cut. The differences between the expected means of the paternal ages for the mongols and the normals did not differ significantly from the difference between the observed means. In contrast, the difference between the expected mean maternal ages for the mongols and the normals was clearly less than the difference between the observed means. In this case the difference between the expected and observed differences was nearly six times the standard error. Thus paternal age could be dismissed as a major aetiological factor in mongolism. A similar conclusion was reached independently by Jenkins in the U.S.A. at about the same time (Jenkins, 1933).

Penrose then turned to the question of the relative importance of maternal age and birth order, which represented a much more difficult statistical problem (Penrose, 1934a, b). By this time he had accurate data on 217 sibships each containing at least one mongol. There were in all 224 mongols and 807 normal children in the sibships. He first showed that, as expected, late birth rank, like maternal age, was highly correlated with the birth of the mongols. But maternal age seemed to be somewhat more closely associated with the occurrence of the abnormality than high birth rank. It therefore seemed reasonable to proceed by testing the hypothesis that the probability of a mongol child depended on maternal age in some unknown manner, but that for any given maternal age it did not depend on birth rank. The problem was made difficult by the varying sizes of the sibships and by the mode of their selection for inclusion in the data. The method which was eventually developed for dealing with the matter involved a rather complex series of calculations which then made it possible to compare directly the observed numbers of mongols in any given birth rank with the

number expected according to the hypothesis. It was also possible to test whether the differences between the two sets of numbers could be reasonably attributed to random sampling error or whether they must be regarded as due to a residual effect of birth order. The result was unambiguous. The observed and expected numbers for each birth rank were in good agreement, and it could be concluded with some confidence that birth rank as such was not an important aetiological factor in the causation of mongolism.

Penrose also considered the question whether the length of the birth interval immediately preceding the birth of a mongol child was of aetiological importance, as had already been suggested by some authors. He demonstrated that where a mongol birth was both preceded and followed by a normal birth, the birth intervals between the mongol and the preceding birth and between the mongol and the succeeding birth were not significantly different; if anything the interval between the mongol and the succeeding birth was slightly longer. Thus an increased birth interval, representing, as had been argued, a period of diminished fecundity, did not appear to be of any causal significance.

This very rigorous analysis of parental age and birth order firmly established the pre-eminent importance of maternal age in the causation of mongolism. However, Penrose recognized that this did not necessarily mean that maternal age was a significant factor in all cases. A great deal of his subsequent work on mongolism was concerned with probing this aspect of the problem further.

One approach was through the study of examples of familial mongolism. Although the majority of cases of mongolism are sporadic, it had long been recognized that occasionally the condition occurred in two or more closely related individuals, though, of course, with a condition as common as mongolism this might well be attributable to chance and need not necessarily imply some genetical factor. A few examples of familial mongolism were encountered in the Colchester survey. Also, some mongols were recorded among the relatives of the non-mongol propoiti. Penrose found,

however, that the incidence of mongolism was about ten times greater among the relatives of the mongols than among the relatives of the non-mongol patients, and with the large numbers of relatives studied the difference was clearly significant statistically, even though the absolute numbers of mongols among the two sets of relatives was quite small. The finding suggested that some genetical factor might indeed be involved, a suggestion which was strengthened by the case of one particular family in which three sisters each had a mongol child and their mother's sister also had one. An additional finding in this family, and one which Penrose felt could hardly be fortuitous, was that the maternal ages for the mongol births were not apparently elevated (Penrose, 1938b). He pursued the problem of maternal age in familial mongolism persistently in subsequent years and was able to confirm that the maternal ages in cases of familial mongolism were on average significantly lower than in cases of mongolism taken as a whole, and that the effect was particularly striking where the apparent inheritance of the condition appeared to have been through the mother.

A number of possible genetical hypotheses which might account for the various features of familial mongolism were worried over and analysed in the next twenty years. But little progress was made until the breakthrough came in 1959 with the discovery by Lejeune and his colleagues of the chromosomal basis of mongolism. Now the many laboriously established facts about the condition began to fall into place, and it was with this that Penrose was mainly preoccupied in the remainder of his research career.

It might perhaps be thought that because of his insistence on the collection of exact factual data about mongols and on their detailed statistical analysis, Penrose regarded these severely retarded individuals simply as convenient biological objects to study. Nothing could be further from the truth. From the beginning at Colchester he was attracted and charmed by their usually good tempered dispositions, their relative liveliness and their frequent liking for music. He derived great pleasure from working with them and also



playing with them. As far as he was concerned there was no question that each was to be regarded as a human being in his or her own right. Certainly it often seemed that he preferred the company of his mongols to that of anybody else.

#### INSULIN AND CONVULSION THERAPY IN THE PSYCHOSES

In 1939 Penrose left Colchester and moved to Canada where he took up an appointment as Director of Psychiatric Research for the Province of Ontario. For the next few years his work was concerned with the psychoses rather than with mental defect. But the problems studied were very different from those he had originally been interested in at the Cardiff Mental Hospital ten years earlier.

A major question in psychiatry which had emerged at this time was the evaluation of the effects of the new forms of therapy which had recently been introduced and which were already being widely applied at many different centres. The two most generally used were the insulin coma treatment and the convulsion treatment first induced by leptazol (cardiazol, metrazol), and later by electric shock. But the published results from different centres about the efficacy of these treatments varied extremely widely. This was evidently because of varying standards of assessing the degree of severity of the disease in different patients, and what constituted improvement or recovery. It was apparent that to determine whether these treatments did any good some quite objective assessment of improvement was needed; also an objective method of estimating the prospects of spontaneous improvement or recovery in the group of patients treated was required. To Penrose it seemed that the simplest objective criterion of improvement was whether or not a patient had been discharged from hospital after a given time, or conversely whether he still remained on its books. Using this criterion he proceeded to devise a quite new procedure for evaluating the effects of the treatments (Penrose and Marr, 1943).

In the Province of Ontario records of all patients who had ever been admitted to the

provincial mental hospitals were available at a central office. The essence of the new method was to compare the actual number of shock-treated patients occurring on the hospital books at a given time after treatment with the expected number calculated from the data on the total mental hospital population. Tables were constructed from the recorded data which gave the chance of a patient still being on the hospital books at a given time in the future, taking into account the age at first admission, sex, and length of time since admission. It was then possible to compare the numbers of treated patients remaining on the hospital books after a given lapse of time since treatment with the numbers expected calculated from the tables.

Data on some 1,600 patients treated with one or another form of therapy were available, and the effects of treatment could be assessed after two years and also after three years of its commencement. The combined results indicated that there was a significant, though modest, positive effect of treatment. However, when the data were broken down by diagnostic category it was clear that the schizophrenics had hardly benefited at all, whereas there was a quite striking effect among the patients classified as having manic-depressive or involutional psychoses. A later analysis in 1944 considered the effects of treatment after a lapse of five years (Penrose, 1944). It now appeared that the number of treated patients still on the books of the hospitals was not very different from the numbers which would have been expected. It appeared that those who had benefited from shock treatment would have improved anyway and would probably have been discharged within five years, but that the treatment had speeded recovery.

When one reads Penrose's account of this work one immediately recognizes the similarity of the approach to that which he had used in his earlier work on the very different problems of maternal age, paternal age and parity in mongolism. In each case he was concerned to assemble by objective criteria a large amount of accurate numerical data which he could then manipulate statistically so that in the end it was possible to compare directly the observed numbers in any category with those expected on

any particular hypothesis. This was indeed the hallmark of his approach to a wide variety of different problems, and he repeatedly showed how, using quite simple observations, he could, by its skilful use, obtain unequivocal answers to what at first sight appeared to be hopelessly obscure problems.

#### PROVISION OF MENTAL HEALTH CARE AND THE INCIDENCE OF CRIMINALITY

Penrose was always interested in social matters, particularly in so far as they were concerned with the provision of adequate care for mental disease and mental handicap. In 1939 and in 1943 he published two short but very intriguing papers on this topic, which are not very widely known. In the first (Penrose, 1939) he used statistics from various European countries to show that there was an inverse relationship between the amount of accommodation provided in mental hospitals and the prevalence of serious crime in the different countries. In the second paper he used the available statistics from different states in the U.S.A. to show that here there was an inverse correlation between the number of admissions of mentally defective patients and epileptics to institutions in the different states and the number of prisoners received from the courts into state prisons (Penrose, 1943). He also noted that in the Union of South Africa a similar effect was to be observed if one compared the European and non-European populations of that country. The number of inmates of mental hospitals per 1,000 of the population was about four times greater for the Europeans than the non-Europeans. In contrast the number of prisoners per 1,000 of the population was nearly six times greater for the non-Europeans than for the Europeans. 'Few Europeans,' he remarked, 'would interpret the correlation between mental illness and white population as evidence of constitutional inferiority of mentality among the whites, though some might be willing to ascribe the large amount of crime in coloured populations to innate tendencies.' Later he often propounded the view that a useful index of the degree of civilization a country had reached might be obtained by dividing the number of people in mental hospitals and institutions for

for the retarded by the number of people in prisons.

#### THE GALTON CHAIR

In 1945 Penrose returned to England to become Galton Professor at University College in succession to R. A. Fisher, and to be Director of the Galton Laboratory, where he worked for the next twenty years. When he first came there, University College was only beginning to become reassembled after the war, during which most of it had been evacuated to places outside London. There was a great deal of bomb damage and inevitably many makeshift arrangements. The Galton Laboratory consisted of a few rooms and virtually no equipment. In effect its research programme had to be rebuilt from scratch.

Penrose, unlike his predecessors in the Galton Chair, was medically qualified and was more directly interested in genetical problems as they related to medicine. Much of his work was indeed in the tradition of the mathematical and statistical approach to genetics for which the Laboratory had previously been best known; but under his direction the work in human genetics became much more broadly based. He returned, of course, to his work on mental deficiency, pursuing many of the problems which he had first tackled at Colchester. But in addition he initiated a wide ranging series of studies on other aspects of human genetics. There seemed to be no facet of the subject on which he did not have some new idea to contribute, and before long he had generated a very active research department indeed. It is not possible here to go into the work that he accomplished in this post-war period. It is in any case more widely known than his earlier work, and no doubt much of it will be mentioned in other papers in this symposium.

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## The Biological Significance of Mongolism

By GEORGE F. SMITH and JOSEPH BERG

Professor Penrose turned his attention to the subject of mongolism at a very early stage in his professional career and retained an undiminished interest in all facets of the problem for more than 40 years. His first publication in this sphere was in 1931 (1) and was entitled 'The creases on the minimal digit in mongolism'. The observations he made in this publication are typical of some of his later ones. It reflected a mind alert to useful detail, in this case the fact that in some mongols there is only one flexion crease on the fifth digit instead of two. This peculiarity rarely occurs in the normal population and therefore provides an additional diagnostic criterion for mongolism. Particularly at a time when chromosomal examination could not be undertaken, this direct simple observation helped in the clinical delineation of a condition which is not always easily recognized.

There are numerous ways to evaluate Penrose's contributions to the field of mongolism. One approach would be to review his 35 publications on the subject. On doing this, it becomes evident that each offers something of interest and significance, but his method fails to provide insight as to why he considered mongolism to be such an important condition to study. A key question is what motivated him to spend so much of his productive life working persistently on this problem. In this respect, he differed from many other talented individuals who have investigated the problem of mongolism and have often left it, after a relatively short period, for some other field of research.

Our purpose in this paper is to examine why Penrose elected to study mongolism for the whole of his professional life, and to look at what has transpired in this field during the time that he was the world's undisputed authority on the subject.

It may well be that Penrose's greatest contribution in this sphere was his emphasis that mongols were not simply retarded individuals but that they had a special clinical condition with important biological implications for the understanding of all mankind. It is because Penrose saw the biological significance of this condition that we have chosen this as the title and theme of this presentation. Penrose visualized the mongol as a remarkable natural phenomenon. In his view the mongol was a very special variety of man, possessing exceptional physical, mental and social characteristics. Nature had thus provided a very unusual and useful experiment, and if it could be understood our scientific knowledge in many human spheres would be increased.

A direct quotation from Penrose may provide an indication of how he saw the problem of mongolism. He wrote:

'Down perceived correctly that in mongolism there was an unusual biological phenomenon which required a special explanation. His scheme for an ethnic classification of idiots was in harmony with contemporary scientific thought which had been influenced by Darwin's work on evolution. Down suggested that if disease could break down racial barriers this helped to demonstrate the unity of the human species. The ethnic theory never became popular, but the terms 'mongolism' and 'mongol' came into general use, although it was admitted by most authorities that the patients so named showed no true resemblance to Mongolian people (Tredgold, 1908) (2). Down's concept of reversion to an earlier phylogenetic type, however, was supported energetically by Crookshank (1924) (3), an imaginative writer who thought that mongolism was a regression, not merely to a primitive Oriental human type but also to the orang-utang.'

It is of interest that Penrose's second paper on mongolism, early in 1932 (4), on the distribu-

tion of the ABO antigens, was published to refute the ideas of Down (5) and Crookshank. He demonstrated that the distribution of these antigens in mongols did not differ appreciably from that in the general populations from which they were drawn. The paper gives some insight into how Penrose's mind worked. He saw a false concept and immediately destroyed it by the simple demonstration of a scientific fact. That Penrose had to attack such an obvious myth gives us some idea of the low level of scientific thought which pervaded the field at the time he entered it.

There is no doubt that some of Penrose's early fascination with mongolism came about because he appreciated that the solution to certain problems could be approached by mathematical means. As early as 1909 it was recognized by Shuttleworth (6) that the relatively advanced age of the mother at the time of gestation was an important factor in mongolism. It was also noted that mongols tended to be the last born in large sibships. It had not been clearly established, at that time, which of the two related factors was more important—the advanced maternal age or exhaustion produced by many pregnancies. Penrose was intrigued by this and related statistical problems. He was able to show mathematically that when the influence of maternal age was eliminated birth order was not in itself a contributing cause. He also demonstrated that while paternal and maternal ages are correlated it was only the maternal ageing factor that was significant in mongolism (7). In addition, the observation had often been made that the time interval between the birth of a mongol and the preceding child is longer than is usual between sibs. Penrose showed that the lengthened interval was an expression of the fact that maternal age and not parity was of causal significance (8). One got the impression from him that he derived much pleasure in discussing with the late R. A. Fisher the mathematical nuances of these problems. The biological implications of these statistical observations were overlooked at the time they were published. This short-sighted view was probably related to the fact that Penrose's mathematical conclusions were made in the field of mental retardation—a rather

unrespectable field for scientific study at the time. We now know that biologically, in regard to ageing, sperms and ova are quite different. This conclusion could have been reached earlier in biology if greater recognition had been given to Penrose's mathematical findings in mongolism.

The clinical diagnosis of mongolism has always presented problems, especially for those physicians having little experience with the condition. As early as 1933 Penrose recognized this and worked out precise criteria for diagnosis (9). The value of a particular trait for purposes of diagnosis depends upon its frequency in the condition studied, compared with its frequency in the general population. Provided that such traits are not too closely correlated they can be used in combination. He specified ten such traits in mongolism, and found that the presence of any four of them in one person made the diagnosis probable. Later, this same approach was used by many investigators. The best example is that of Ford-Walker's (1957) (10) use of dermatoglyphic traits to provide an index score in favour of, or against, the diagnosis of mongolism.

During the 1930s there were three significant papers suggesting that mongolism might be due to a chromosomal abnormality. Waardenburg (1932) (11) mentioned non-disjunction as a possible explanation, and in 1934 trisomy was postulated by Bleyer (12). While these two propositions have subsequently been proven to be correct, there were difficulties in accepting them at the time they were suggested. First, there was no evidence from experimental genetics to indicate that non-disjunction could be strongly influenced by maternal age; and, secondly, familial cases often showed that the abnormality was transmitted through normal carriers. This latter pattern of inheritance suggested the transmission of an abnormal chromosome, sometimes resulting in the production of physically damaged offspring with unbalanced chromosome content. This type of inheritance is passed from a parent with a balanced translocation, particularly the mother. It was on this basis that in 1939 Penrose suggested that in some cases of mongolism



there could be a chromosomal abnormality (13). He and his associates continued to pursue the idea of a chromosomal aberration in mongolism. This is demonstrated in a paper by Mittwoch in 1952 (14) on her studies of spermatogenesis in a mongol. She concluded that at diakinesis there were 24 chromosomal masses, but because the correct diploid number was considered to be 48 at the time this finding was not thought to be unusual.

Eventually, the crucial chromosomal error in mongolism was demonstrated by Lejeune, Gautier and Turpin in 1959 (15), when they showed that mongols have 47 chromosomes and trisomy 21. Immediately following this, Penrose and his colleagues detected a Klinefelter-mongol with 48 chromosomes (16). In addition to this, in 1961 Penrose, in association with Ellis and Delhanty (17), demonstrated the first familial transmission of a translocated chromosome in a family containing two mongol sibs. This substantiated his idea of the unbalanced form of mongolism being transmitted through a balanced carrier.

Penrose popularized the diagnostic use of dermatoglyphs in clinical medicine, particularly in relation to chromosomal abnormalities. His wide-ranging investigations of dermatoglyphs (18) in mongolism are well known and are closely linked with those of such well-known authors on the subject as Cummins, Ford-Walker and Holt. Penrose's most extensive study in this sphere was a genetic one of the position of the palmar triradius  $t$  in mongolism. He devised the  $atd$  angle to arrive at a metrical value which could serve to replace the rather more qualitative differentiation of a distal triradius,  $t''$ , from a proximal one,  $t$ , or from one in an intermediate position,  $t'$ . The distribution of the  $atd$  angle measurements is in the form of a continuous variant. The genetical factors which influence the width of that angle also influence the susceptibility to mongolism in certain families. This susceptibility appears to be increased with the predisposing genetical factors—for example, mosaicism—are present in the mother. Towards the end of his life, Penrose again devoted a great deal of time to dermatoglyphic considerations, using many of the dermal prints which he had patiently

collected for decades from individuals with mongolism and their relatives. His efforts resulted in unique observations on topological aspects of dermatoglyphic patterns which have considerable relevance to the biology of mongolism.

Penrose's lecture (19), at the time of receiving the Kennedy Award for outstanding scientific contributions to mental deficiency, was on the topic of mosaicism in mongolism. Mosaicism was first demonstrated in sex chromosomal abnormalities by Ford, Polani, Briggs and Bishop (20) in 1959, and in 1961 was identified in mongolism by Clarke, Edwards and Smallpiece (21). Penrose quickly recognized the importance of this phenomenon as a modifying influence on physical and mental characteristics of mosaic individuals. Nature again had provided a special experiment, best exemplified in the mongol. For Penrose, mosaicism helped to clarify certain mysteries about partially affected mongols (22). Mongolism now became an even more remarkable condition. At one end of the scale was the standard mongol with characteristic physical features and mental abilities; with mosaicism these features blended with those in the normal population so that clinical recognition was impossible in certain cases without the use of chromosome analysis. Penrose devised means for measuring this blending process of nature.

Before anything was known about chromosomal anomalies in mongolism much had been learned from family investigation. In certain families some of the patient's sibs and other relatives were affected. Direct transmission from a mongol mother to her child was also known. Penrose carefully monitored this type of critical information (23). He noted that in some familial cases there was a weakened influence of the maternal age factor. From this type of information he was able to divide the distribution curve of mothers' ages in mongolism into the two now classical forms, one age-independent, the other age-dependent. The interpretation of these two curves fits the biological observations of the different chromosomal forms of mongolism that are now well known.

The relationship of increasing maternal age and non-disjunction is probably the most

important problem to be solved in mongolism today. This problem is of great importance to the fields of biology and reproduction. Penrose hypothesized (22) that 17 or more breaks of the spindle fibres attached to the 21 chromosome during metaphase could cause non-disjunction. This hypothesis best fitted a mathematical model based upon incidence figures of mongolism for the different maternal age groups. After a certain number of breaks, the spindle mechanism would be unable, in the first meiotic division, to overcome the resistance required to separate the paired chromosomes, especially those supplied with nucleolus organizers like the acrocentrics in man. This is certainly an attractive concept. It is an illustration of how Penrose, whenever possible, converted abstract mathematical concepts into a form that was practical and could be visualized.

While Penrose's ideas were characteristically thought out with great care, not all of them, as one would expect, were scientifically successful. He was troubled by the fact that up until 1965 large numbers of mongols with trisomy 21 had been found, but trisomy 22 was not established. An occasional non-mongol mentally retarded individual with an extra chromosome in the G group had been reported. In some of these cases, trisomy of chromosome 22 had been proposed, but this chromosomal diagnosis remained in doubt, since the extra small acrocentric chromosome could as easily have been a deleted larger autosome or even an aberrant Y chromosome. At the time, of course, the identification of a specific chromosome was less exact than it is today. Penrose felt strongly that homeology between chromosomes 21 and 22 was the answer to the problem. If chromosomes 21 and 22 contained similar genes, then trisomy of either chromosome would produce two closely related clinical conditions, both recognizable as mongolism. The key to the solution of this problem for Penrose was to examine the intercorrelations of 'mongol' traits and to search for those which showed a tendency to be present in one group of patients and not in another. The ideal situation was to find two traits, both characteristic of mongolism, that were negatively correlated within the groups of patients. Penrose chose dermatoglyphs as the

most likely source of ideal traits to study. After a rather intensive investigation, he distinguished two types of mongols which he called the  $\alpha$  type, thought to be caused by trisomy 21, and the  $\beta$  type presumably caused by trisomy 22 (24). We now know that there is no homeology between chromosomes 21 and 22, and there are no trisomy 22 mongols. However, it cannot be concluded that there are not two types of mongols having different physical and dermatoglyphic features which are correlated quite differently in the two groups. While Penrose's basic premise was wrong, he demonstrated the kind of imagination that opens up new avenues of scientific thought.

The last topic for comment here has a very personal ending to it. During the early 1960's, a series of publications showed that the leucocyte enzymes were elevated in mongolism. The enzyme abnormalities could most easily be demonstrated in the lymphocytes of mongols. This information, in conjunction with the known increased incidence of leukaemia in mongolism, led Penrose and his associates to conclude that an electron microscopic study of mongol lymphocytes would be of value. It was during this study that an unusual crystalline material was observed in the lymphocytes of some of the older mongols (25). In order to get data from age-matched controls, Penrose served as one of these controls. While examining his lymphocytes, abnormalities were observed in his cells which were later confirmed to be those of chronic lymphatic leukaemia.

Penrose approached the problem of mongolism scientifically, but his personal dealings with mongol individuals were always considerate and gentle. He respected mongols as persons, and in his contacts with them he received as much pleasure from them as they received understanding and help from him.

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## Geographical Differences in the Prevalence of Mental Deficiency

By HANS OLOF ÅKESSON

### DIAGNOSTIC CRITERIA

Like other mental disorders, mental deficiency presents great problems in diagnosis. These diagnostic problems derive ultimately from the fact that a medical diagnosis can be made only in exceptional cases. Mental retardation is not a disease in itself, but only a symptom which may be found in a number of different conditions. It is true that there are a great number of oligophrenia syndromes with known aetiology, but together they represent a numerically small group. When one considers, in addition, that no clear cut distinction between the normally intelligent and the mentally retarded can be made, since the difference is merely quantitative, the difficulties of diagnosis become manifest.

Another aspect is, of course, that the diagnosis one employs must be adapted to the purpose of the investigation. If a population study is undertaken for scientific purposes only, for example to throw light on variations of rate, an operational definition of mental retardation must be employed, for it is only thus that comparison of one study with another will be possible and meaningful. If, on the other hand, a field study is undertaken with a view to using the results to render the care of patients with impaired psychic development more effective, an operational definition cannot be employed; in every investigation of this sort the diagnosis must be based on a clinical and socio-medical judgement. Thus, for example, when studying the need for care one can never define one's criteria in advance. For practical reasons one cannot go farther than a subjective judgement. It is clear from this that one cannot compare different studies of this kind, nor is this the intention. One must simply bear in mind that the figure of mental retardation one has obtained can only serve the original purpose of the

investigation, for instance to form a basis for the treatment planning. The diagnosis 'mental retardation' will thus vary with the aim of the investigation.

If a greater need for care is found in one geographical area than in another, one cannot conclude from this that the real prevalence of mental retardation is greater in the one area than in the other. This is because judging the need for care is ultimately a question of attitudes, that of the investigator as well as those of the retarded person's relatives. It may seem unnecessary to point out these fairly obvious matters, but experience shows the contrary.

Despite the diagnostic problems, however, it is fairly certain that geographical differences in the prevalence of mental deficiency do exist. To elucidate this I should like to discuss very briefly four epidemiological studies from Sweden: one of them was carried out recently by Dr. Wallin from our unit (Wallin, 1974), the other three investigations were undertaken by myself (Åkesson, 1916, 1963 and 1967).

### SOUTHERN SWEDISH SURVEY

I determined the prevalence of mental deficiency in ten randomly chosen rural parishes in Malmöhus County. On 1 January 1959, these parishes contained altogether 7,533 inhabitants. I used an operational definition for mental deficiency based on the score obtained on the revised Stanford-Binet scale, Form L. Thus, I classified subjects as mildly deficient when they had an IQ lying between two and three times the standard deviation below the mean—that is, when they had an IQ between 67 and 52—and as severely deficient when they had an IQ lying more than three times the standard deviation below the mean—that is, when they had an IQ below 52.

I screened these parishes for mental deficiency, first by going through the official records likely to contain information in this respect, and secondly by interviewing persons who had good first-hand knowledge of the people living in their neighbourhood.

According to the criteria I used, 1.8 per cent of the population in these southern parishes were mentally deficient—1.2 per cent mildly and 0.6 per cent severely deficient. No significant differences emerged between the sexes in these respects.

The parishes differed in prevalence of mental deficiency, but significantly only for the mild forms. The parishes characterized by high rates of immigration and emigration had a high prevalence rate of mental deficiency, those with a low rate of immigration and emigration had a low rate. Fig. 1 shows the percentage of inhabitants who moved away during the years 1909–1958 from: (I) parishes with more than 2 per cent mental deficiency, designated as I in the figure; (II) parishes with between 1 and 2 per cent, designated as II; and (III) parishes with less than 1 per cent, designated as III. As can be seen, the prevalence rose with the amount of emigration. Closer analysis revealed that this was particularly true of the mild forms of deficiency.

#### URBAN/RURAL SURVEY

In my second investigation, I studied the geographical distribution of mental deficiency from another angle, by studying the geographical origin of 1,014 severely deficient patients admitted to the Vipeholm hospital during the years 1940–60; during these years this hospital took in severely deficient subjects of both sexes from all over Sweden. As the number admitted from the separate counties varied from time to time, I proceeded as follows: after dividing the patients by county, I subdivided them according to whether they came from urban or rural communities. It turned out that for only 3 out of the 24 counties did more patients come from urban than from rural communities. The figure for the urban communities was 0.10 severely deficient per thousand, as opposed to 0.18 per thousand for the rural communities.

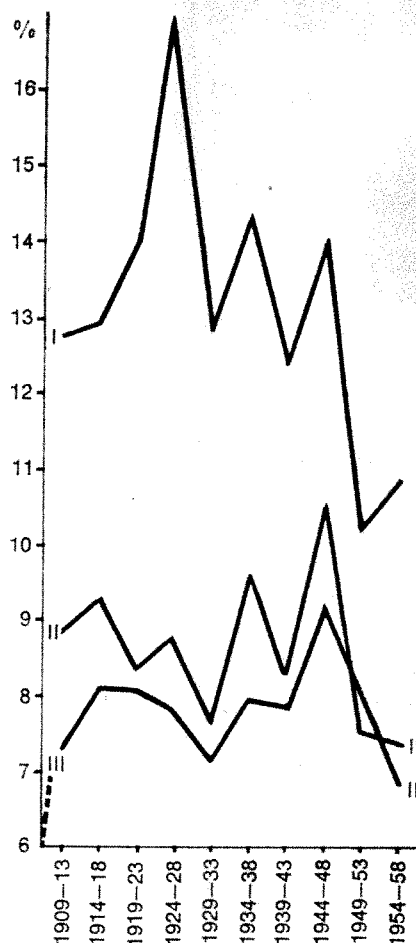


FIG. 1.—Percentage of migration out of the regions, 1909–1958 (for explanation see text).

As 21 of the counties showed more mental deficiency coming from rural than urban communities, and the 3 exceptions lie a long way from each other, the disproportion could not have been due to local factors or to the hospital favouring admissions from the country.

Parishes in Sweden are grouped in the official statistics according to the density of their population—on the percentage of inhabitants living in densely populated areas (by densely populated is meant a collection of 200 persons or more living at the most 200 metres from each other). The 1,014 patients in the Vipeholm series proved to be unevenly distributed among communities of different population density.



As shown in Table I, more came from sparsely populated communities than from densely populated ones.

Fig. 2 shows that the prevalence rate of severe mental deficiency in this series varied inversely with the density of the population from which the patients came, both for the whole of Sweden and for the three main regions: Götaland, Svealand and Norrland.

As study of one hospital population is apt to be handicapped by many sources of error, I also studied the urban/rural distribution in another series: all the severely deficient born during the years 1940-44 who stayed at any of the country's institutions for the mentally deficient during

the years 1955-59. Table II gives this series divided into rural and urban communities. Here again we find more severely deficient coming from the country (1.81 per thousand) than from the towns (1.48 per thousand); the difference is statistically significant ( $P < 0.005$ ). The inverse relationship between the prevalence of severe deficiency and the density of population was in no way connected with the way in which the inhabitants of the respective communities earned their living.

#### WESTERN SWEDISH SURVEY

Thirdly, I determined the prevalence of severe mental deficiency in two islands on the

TABLE I  
*Distribution of 1,014 institutionalized low-grade mental defectives by place of residence in parishes with different percentages of the population clusters*

| Percentage of the population living in population clusters | Males    |          | Females                                              |          | Both sexes                                     |          |
|------------------------------------------------------------|----------|----------|------------------------------------------------------|----------|------------------------------------------------|----------|
|                                                            | Observed | Expected | Observed                                             | Expected | Observed                                       | Expected |
| 0-10 .. ..                                                 | 140      | 107.5    | 52                                                   | 44.3     | 192                                            | 151.8    |
| 10-30 .. ..                                                | 93       | 76.5     | 39                                                   | 30.6     | 132                                            | 107.1    |
| 30-50 .. ..                                                | 112      | 93.1     | 43                                                   | 29.4     | 155                                            | 132.5    |
| 50-70 .. ..                                                | 72       | 69.0     | 40                                                   | 30.4     | 112                                            | 99.4     |
| 70-90 .. ..                                                | 60       | 71.2     | 23                                                   | 29.0     | 83                                             | 100.2    |
| 90- .. ..                                                  | 230      | 289.7    | 110                                                  | 133.3    | 340                                            | 423.0    |
| Total .. ..                                                | 707      | 707.0    | 307                                                  | 307.0    | 1,014                                          | 1014.0   |
| $\chi^2 = 31.4, 5 \text{ d.f.}$<br>$P < 0.001$             |          |          | $\chi^2 = 12.3, 5 \text{ d.f.}$<br>$0.02 < P < 0.05$ |          | $\chi^2 = 41.1, 5 \text{ d.f.}$<br>$P < 0.001$ |          |

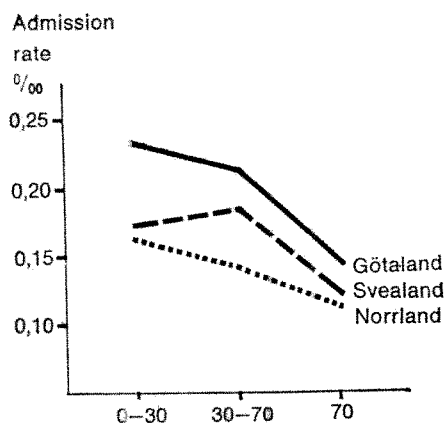
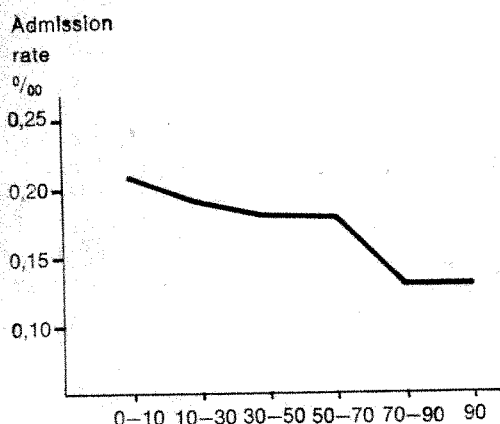


FIG. 2.—Percentage of the population living in population clusters and corresponding admission rate of low-grade mental defectives.

TABLE II

*Urban-rural distribution by place of residence of the low-grade mental defectives born in 1940-1944 who were inmates of Swedish institutions during the period 1955-1959*

| Place of residence | Estimated population | Number of low-grade mental defectives | Rate per 1000 |
|--------------------|----------------------|---------------------------------------|---------------|
| Urban ..           | 273,400              | 405                                   | 1.48          |
| Rural ..           | 280,600              | 507                                   | 1.81          |

west coast of Sweden. On 1 November 1964, these islands had 17,303 inhabitants. This population was predominantly rural, as in the southern study. Demographically speaking, the two regions were of the same nature. Between 1910 and 1960 many inhabitants had moved away: about 33 per cent in both populations. The two were also alike as to birth and death rates and age distribution. The same was true of the population density, which on the census day amounted to 30 inhabitants per square kilometre in the southern population and 32 in the western population. Thus if the prevalence rate of mental deficiency depended on the density of the population and one used the same method of investigation, one could expect to find that the western population contained the same proportion of mental deficiency as the southern population.

Table III gives the rates found in the two studies. The figure covers only severe mental

TABLE III

*Prevalence of severe mental deficiency in a southern and western population in Sweden, subjects divided by sex*

|                     | No. of<br>inhabi-<br>tants | Severe mental<br>deficiency |      |  |
|---------------------|----------------------------|-----------------------------|------|--|
|                     |                            | No.                         | %    |  |
| Southern population |                            |                             |      |  |
| Males .. ..         | 3,919                      | 21                          | 0.54 |  |
| Females .. ..       | 3,614                      | 23                          | 0.64 |  |
| Both sexes ..       | 7,533                      | 44                          | 0.58 |  |
| Western population  |                            |                             |      |  |
| Males .. ..         | 9,245                      | 60                          | 0.65 |  |
| Females .. ..       | 8,058                      | 45                          | 0.56 |  |
| Both sexes ..       | 17,303                     | 105                         | 0.61 |  |

deficiency, as this is all that was studied in the western survey. According to the criteria I used, 0.58 per cent of the southern population were severely deficient and 0.61 of the western population. These figures agree well; the difference is not significant.

#### URBAN SWEDISH SURVEY

The recently carried out study by Wallin (1974) was undertaken in Mölndal, a town in Middle Sweden with a population of 33,400. This town lies south of Göteborg. It has a well-differentiated economic life, with several large industries. Without any change in boundaries the population has roughly doubled in the last 25 years. From the demographic aspect Mölndal accords closely with that of most Swedish urban communities.

The population examined consisted of persons registered in the census as resident in Mölndal on 1 November 1969. The same operational definition for severe mental retardation as designed by me in the earlier-mentioned studies was used. A total of 82 probands were traced. This corresponds with a prevalence of 0.25 per cent. Thus in this urban study Wallin found, by the same diagnostic procedure, a rate of severe mental retardation that is roughly half of that found in my two rural studies.

#### DISCUSSION

Mental deficiency may develop through one of four mechanisms: (a) polygenic inheritance (mild forms); (b) simple inheritance; (c) chromosomal anomalies; and (d) external factors; the last three being especially common for serious forms of mental deficiency.

To begin with the inherited forms, we know that a shift in the equilibrium of genes occurs through deviations from panmixia. Four processes can distort the balance in the gene pool: (a) selection; (b) mutation; (c) genetic drift; and (d) migration. In this case we can probably disregard genetic selection, for it is not likely that the conditions governing selection vary from one geographical region to another; and especially not in the case of severe mental deficiency, for the severely deficient rarely have children. Nor is there much reason to suspect that variations in the pressure of mutation can



lead to any differences in distribution. Genetic drift takes place only in isolated communities with a sparse population, but one can presumably exclude this as well, for the urban/rural study showed that the same tendency prevailed throughout the whole of Sweden.

This leaves selective migration—a highly conceivable explanation in this case, in my opinion, and, when one thinks of it, a very natural explanation. It is easier, for both emotional and practical reasons, to take care of a severely deficient child in a sparsely populated area. The severely deficient have no say as to where they live; they live where their family decides. It is very likely that parents with a mentally deficient child tend to migrate away from densely populated areas to sparsely populated ones. By the same token, a severely deficient child living in a sparsely populated area presumably keeps its parents from moving to more densely populated areas—which they might well have done, as we know that the general trend is from the country to the towns.

We can also assume that the same mechanism of selective migration causes a larger than average proportion of the mildly deficient in the country. All rural areas show a high rate of emigration, but it is not the mildly deficient who leave—it is the enterprising and intelligent people who do so. This helps to increase the proportion of mentally deficient in sparsely populated areas.

As to the forms of mental deficiency caused by chromosomal anomalies, we know very little about the way they develop. One thing we know for sure is that a high maternal age is a factor in many chromosomal anomalies. We also know that maternal age is higher in the country than in the towns. This may also help to explain the uneven distribution of mental deficiency. It

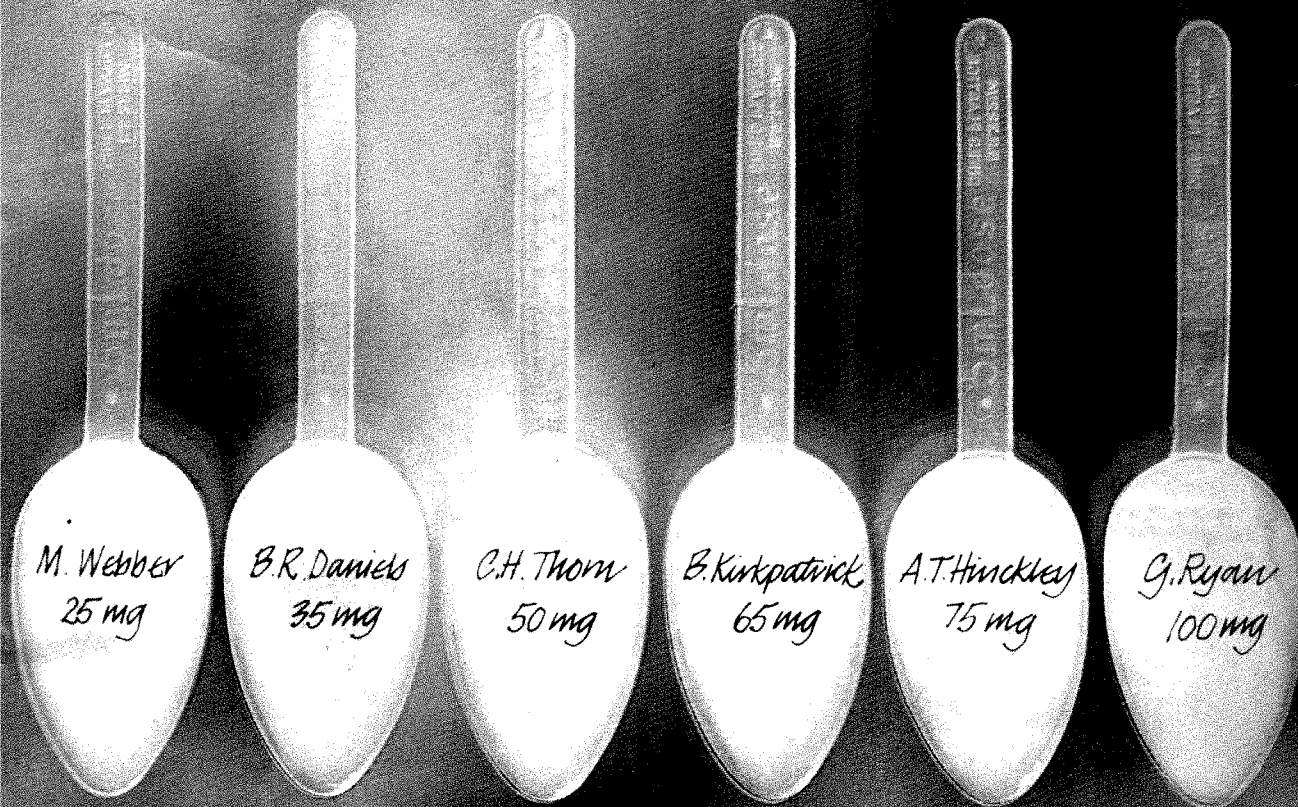
has also been suggested that various other noxious influences, such as infections, auto-immunization and various drugs, might cause anomalies in the chromosomes but nothing definite has been proved in these respects. Nor is it likely that these factors could affect the distribution of the mentally deficient as between geographical regions; it is more probable that selective migration also explains the uneven distribution of the forms of mental deficiency due to chromosomal anomalies.

Lastly, as to the forms caused by external injury, we know of a large number of circumstances which before, during and after birth may lead to mental deficiency. Nowadays however, conditions as regards nourishment, obstetric care, baby clinics and the like, probably do not vary much from one part of Sweden to another. To sum up: It is not yet possible to explain in full the inverse relationship between prevalence of mental deficiency and density of population. It may be due to a series of factors. But in my opinion much of it is due to a form of selective migration—to families with mentally deficient children being more likely to move to or remain in sparsely populated areas than families without such children.

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## Case and Kindred in Mental Deficiency

By B. W. RICHARDS

The analysis of family data in the hope of detecting a recognizable pattern in the distribution of disease may be of value in respect of cause and of prevention. The recognition of classical Mendelian ratios, for instance, is both a partial explanation and an opportunity for genetic counselling which may lead relatives to take eugenic measures. In mentally subnormal populations, however, the occurrence of disease in families often shows more complicated distributions. From knowledge of the relationship between cause and distribution models may be constructed with which empirical data may be compared, for instance, in maternal-foetal incompatibility in respect of some antigen, or in polygenically determined diseases showing threshold effects in liability to disease.

Before discussing pathological conditions I should like to consider briefly those mentally subnormal subjects who are generally believed to be part of the normal population in respect of intelligence and are at the lower end of the normal distribution curve judging by the results of intelligence tests. They occupy the IQ range of about 50-70, and the majority, although not all, of those in this range have been referred to as normal variants and by other terms. Important evidence for the dichotomy between these more numerous and mildly subnormal subjects and the more rare more severely subnormal subjects afflicted with various pathological conditions was provided by the Colchester Survey (Penrose, 1938). In *The Biology of Mental Defect* (1949) Penrose wrote: 'The frequencies in the two groups are characteristic. Severe cases are comparatively uncommon, and the events which produce them tend to be relatively rare accidents, rare diseases or rare genetical processes. Conversely, mild cases are common, and most causes of disability here are ordinary events, either environmental or genetical.'

Some authors have suggested that a person defined as mentally subnormal is, *ipso facto*, pathological. To define the word in this way makes this dichotomy impossible and I believe introduces much confusion into the problem. It leads to the use of the word in two different senses, one having regard to the cause, the other to the consequence. The term 'pathology' has traditionally been applied to underlying morbid processes and is so defined in *Butterworth's Medical Dictionary* (1965). Penrose (1949) used the word in this sense when he said 'There is no doubt that a very large proportion of idiots and imbeciles are correctly described as "pathological" in the ordinary sense of being diseased.'

If it is assumed that the distribution of ability on intelligence tests should be Gaussian, the empirical findings fit the assumption down to an IQ of about 50 (Table I); but below that level there is a considerable excess which may be explained as due to pathological causes of mental defect, whereas the intelligence of subnormal subjects with IQ's above 50 is determined by the same additive factors (whether genetic or environmental) as those which determine the intelligence of the general population. On this hypothesis one expects a considerable degree of familial incidence of mental sub-

TABLE I  
*Lower limits of the distribution of intelligence in the general population (age group 10-14 years) (Penrose, 1972)*

| Percentage distributions   | Idiot | Imbecile | Feeble-minded | Total |
|----------------------------|-------|----------|---------------|-------|
| Observed defectives        | 0.06  | 0.24     | 2.26          | 2.56  |
| Normal Gaussian prediction | 0.00  | 0.04     | 2.23          | 2.27  |

normality among the relatives of *propositi*, and this was found to be so in the Colchester survey and in other surveys on different samples (Fraser Roberts, 1952; Halperin, 1945).

The degree of subnormality of relatives, on the average, is expected to be less and to show regression to the mean (Table II). Referring to the data of the Colchester survey, Penrose (1972) wrote: 'The patients in the fertile range, with IQ 50 or above, have sibs whose mean IQ is situated not far from the mid-point between their own mean level and 100. Half sibs, nephews and nieces of a similar set of patients were found to have a mean IQ situated not far from the point three-quarters of the way between the level of these *propositi* and 100.'

It is clear that comparison between patients with IQs below 50 and their relatives does not show similar regressions, the IQs of parents and unaffected sibs showing sharp segregation and usually being normal.

Some authors (Crome and Stern, 1972) have expressed the view that mild degrees of mental subnormality are caused in the same way as severe degrees of it, the difference being simply that the disease causing mild subnormality is a mild attack, for instance, slight birth injury or a mild case of kernicterus or of phenylketonuria. While it is true that some cases of mental subnormality of mild degree may be so caused and that there are no doubt other undiagnosed causes of the kind among them, it is unlikely that most of them are caused in this way; if they were, the findings in respect of intrafamilial

correlations and regressions would be quite different from what they are. Empirically, it appears that those who are mildly subnormal often have dull parents and sibs who have attended schools for the educationally subnormal and some who have been admitted to institutions.

It is not necessary to discuss the familial distribution of conditions caused by genes of large effect producing more or less classical Mendelian ratios, but there may be unusual distributions of disease where the genotype of the mother is relevant but not that of the father or the children, as, for instance, in maternal phenylketonuria, in which the metabolic disorder of the mother damages the foetus. Hsia (1971) examined cases reported in the medical literature and found that 61 out of 63 children born to phenylketonuric mothers with blood phenylalanine levels above 20 mg./100 ml. were affected, whereas only one was affected out of 16 born to mothers with phenylalanine levels below that level. The subject has been reviewed by Cowie (1973). Other metabolic errors may act in a similar way. The condition has the appearance of being transmitted through females only to children of both sexes, and the proportion of affected children will be high. In the only two families of the kind I have encountered, all the children were affected, three in one and seven in the other. Since mothers are selected for fertility they are usually not severely subnormal, whereas their affected children usually are. In this respect,

TABLE II  
*Mean Stanford-Binet IQ for defective patients and their relatives (Penrose, 1972)*

|                                  | Type of relationship patient | Number of pairs | Patients' mean IQ | Relatives' mean IQ |                                      |
|----------------------------------|------------------------------|-----------------|-------------------|--------------------|--------------------------------------|
|                                  |                              |                 |                   | Observed           | Expected on additive gene hypothesis |
| (i) Patients with IQ 50 or above | Sib                          | 101             | 65.8              | 84.9               | 82.9                                 |
|                                  | Half-sib, nephew or niece    | 143             | 63.2              | 89.5               | 91.8                                 |
| (ii) Patients with IQ below 50   | Sib                          | 120             | 24.2              | 87.4               | 61.1                                 |
|                                  | Half-sib, nephew or niece    | 90              | 33.3              | 95.1               | 83.3                                 |

especially as the father may also be dull or subnormal on account of assortative mating in respect of intelligence, there may appear to be the same type of IQ regression as one finds with normal variants in this intelligence range. As the mother is homozygous for a rare recessive gene her parents will be heterozygotes and she may have homozygous brothers and sisters, so that some of the mother's sisters could have affected children. It is also likely that there will be a raised consanguinity rate between the maternal grandparents of affected propositi. On the father's side, the disease incidence is the same as in the general population. There may be unknown metabolic anomalies which do not cause mental subnormality or any gross physical anomalies in the mother but which nevertheless lead to foetal damage.

It has been suggested that mothers heterozygous for the phenylketonuric gene, who have reduced powers of metabolising phenylalanine but are themselves mentally and physically normal, have a high abortion rate, and there is some evidence to support this (Cohen, 1971; Saugstad, 1972). It is reasonable to assume that there could be recessively determined metabolic errors in connection with which the heterozygous females may damage their foetuses, and it is interesting to examine the expected distribution of disease in such families (Fig. 1).

Both sexes are affected, and the proportion of affected children will presumably be very variable. There are several peculiarities of a disease caused in this way. Firstly, it has the appearance of being transmitted through the mother, but both sexes are affected. The proportion of affected sibs of the propositus will depend on how seriously unfavourable the maternal metabolic environment is. This may vary considerably and may possibly be influenced by the foetal genotype. If affected subjects are infertile the disease cannot occur in two successive generations of direct descendants. Heterozygous male sibs of propositi may have heterozygous daughters who will damage their foetuses, so a generation will be skipped when transmission occurs through males. Maternal first cousins may be affected, but not maternal uncles and aunts, transmission being through the maternal grandfather.

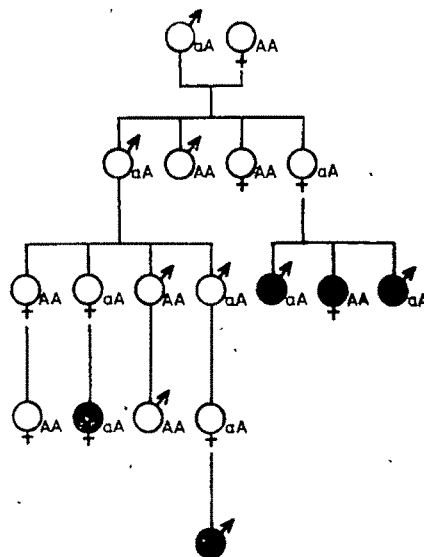


FIG. 1.—Damage to foetus caused by transmission from mothers heterozygous for an incompletely recessive gene for an inborn error of metabolism.

If affected subjects are fertile, half the affected females in the sibship of the propositus may be heterozygotes themselves and damage their foetuses. There could be transmission from affected daughters to affected sons and daughters for several generations. Maternal uncles and aunts may be affected if the maternal grandmother is heterozygous. The picture is, therefore, rather complicated and variable. The frequency of disease may be influenced by how unfavourable the maternal environment is, the genotype of the foetus, environmental factors such as nutrition during early pregnancy, and the fertility of affected subjects.

A somewhat different type of aetiology is that of maternal-foetal incompatibility in respect of an antigen which the foetus has and the mother lacks. Here, unlike what occurs with genes influencing maternal metabolism, the genotypes of mother, father and foetus all affect the issue, in that the mother of a susceptible foetus must be homozygous negative and the foetus must be heterozygous. The father may be either homozygous positive or heterozygous. The classic example is rhesus blood group incompatibility, but there may be other diseases due to incompatibility of as yet unknown antigens. The familial appearances of incompatibility

of this type was examined by Penrose in 1946. The result will differ according to whether the negative gene (as I will name it for brevity) or the positive gene is rare (Fig. 2). Since the mother's parents must be heterozygotes, some of the mother's sisters may be homozygotes like the mother.

If the negative gene is rare, most males will be homozygous for the positive allele and all children are susceptible. There are not likely to be negative genes among the relatives of the fathers. The disease, therefore, affects males and females in the sibship of the propositus, appears to be transmitted through females on the mother's side, and affects maternal first cousins. As parents are usually both homozygotes, all children are incompatible in the sibships. Since it is assumed that the negative gene is rare, there will be a raised grandparental consanguinity rate on the maternal side. Only sibs of the propositus and maternal first cousins are likely to be affected.

If the gene for presence of the antigen is rare, so that homozygous negative subjects are quite common in the population, the disease will appear to be transmitted through the father (Fig. 3). Unlike the mother of a propositus, who, being homozygous negative, cannot herself be susceptible, the father of a propositus is a heterozygote and may himself be affected; so

may his sibs or his brother's children. In the sibship of propositi one half are susceptible. Susceptible brothers have half their children susceptible; susceptible sisters have normal children, half of whom are carriers. A generation

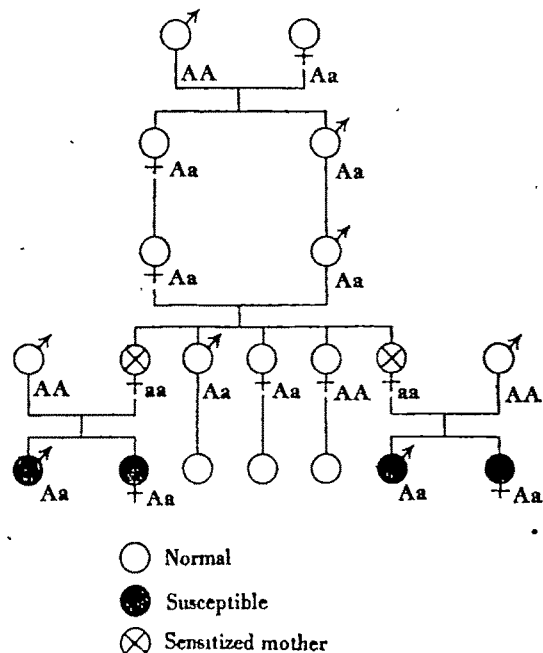


FIG. 2.—Maternal and foetal incompatibility when *a* is very rare. Typical pedigree. (Penrose, 1946).

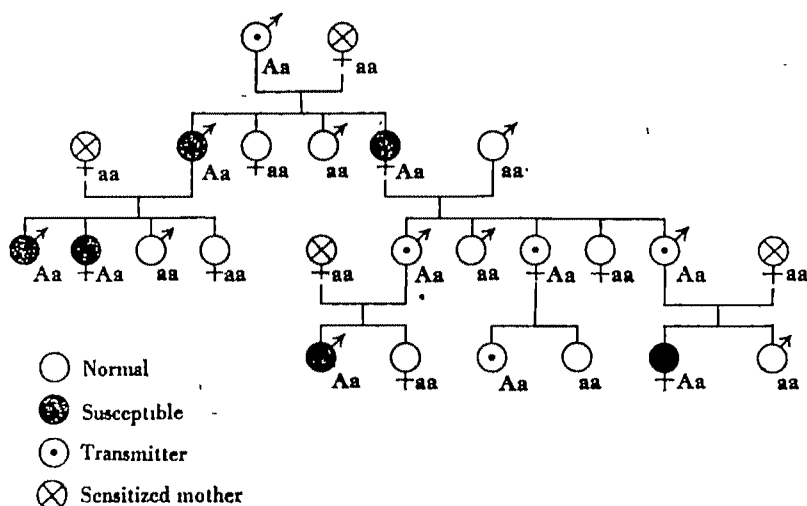


FIG. 3.—Maternal and foetal incompatibility when *A* is very rare. Typical pedigree. (Penrose, 1946).



may be skipped. Penrose observed that 'diseases likely to be due to maternal and foetal incompatibility should be detectable on the basis of pedigree studies'. Taking  $p$  to be the frequency of the gene for the antigen and  $q$  to be the frequency of the recessive gene for the absence of it, Penrose (1946) calculated the expected frequency of various relatives of the propositus, such as sibs, cousins, uncles and aunts, who would be susceptible and incompatible with their mothers. Whatever the gene frequencies, the disease is likely to show a late birth order effect, and secondarily a late parental age effect. It also differs from disease due to metabolic disorders in that the antibody titre tends to rise late in pregnancy. One is not, therefore, likely to encounter such congenital malformations as congenital heart disease, which often occurs in the children of phenylketonuric mothers, but neurological disorders might occur, caused for instance by demyelination or central nervous system defects.

It is interesting to examine the consequences of maternal-foetal incompatibility in respect of an antigen the gene for which is situated on the X-sex chromosome (Fig. 4). The most striking result is that only females will be affected, regardless of the relative gene frequencies. If the gene for the absence of an antigen is a rare recessive, the mother's sister may have affected daughters. As she is homozygous negative and one may suppose her husband to have the commoner allele for presence of the antigen, the daughters must be

positive and the sons must be negative. The maternal grandmother must be heterozygous and the maternal grandfather must have the antigen-negative gene, so there will be homozygous negative sibs of the mother and the mother's sisters will have affected daughters. The disease will therefore appear to be transmitted through the mother's side of the family and is only likely to occur in the female sibs of the propositus and in maternal female first cousins, without further transmission.

If the gene for the presence of the antigen is rare (Fig. 5), some of the father's brothers will have affected daughters. If any such daughters

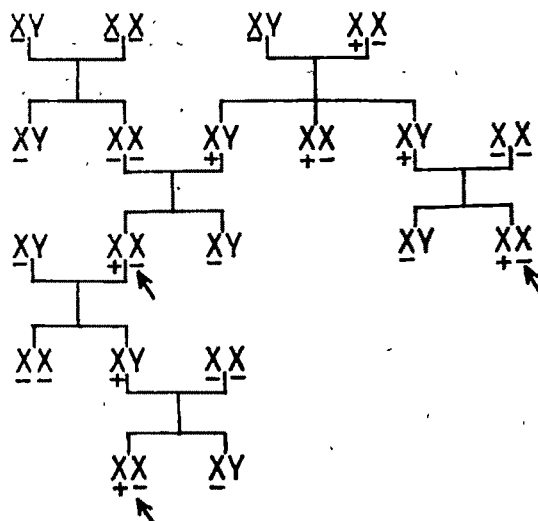


FIG. 4.—Maternal and foetal incompatibility when the gene for the antigen is sex-linked.

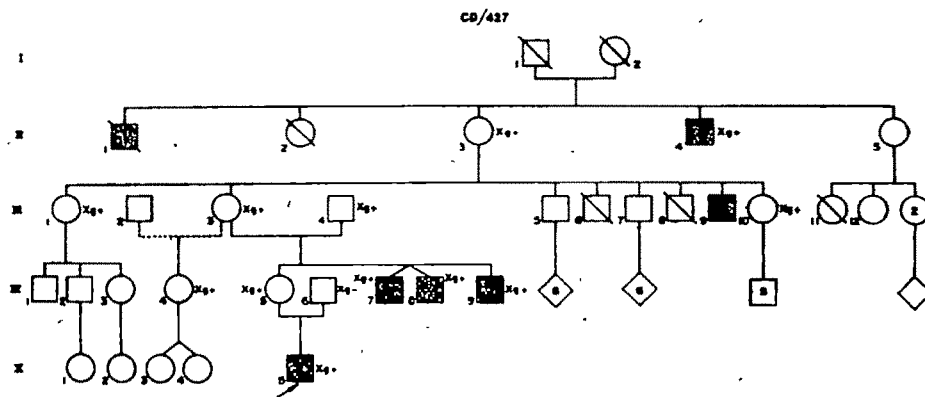


FIG. 5.—Pedigree of a family in which only males are affected. (Clare Davison, 1973).

are fertile, they will have some antigen-positive sons who will be normal but will have heterozygous daughters who may be affected. Again only daughters are affected and the disease skips a generation. It could go on skipping generations indefinitely.

Families containing affected males only or affected females only often occur by chance but may result from the inheritance of sex-linked genes or from the mechanism just described. Many authors have noted the excess of males in mental deficiency institutions, and this tends to increase with increasing severity of defect. There are known specific diseases, such as hydrocephalus, spastic diplegia, a form of gargoylism, deaf-mutism, hyperuricaemia, and so on, due to sex-linked genes, but they are not sufficient to account for the excess of males. An excess of males or of females may also occur in polygenically determined conditions in which the sexes may differ in their liability to disease, but the propiti in such sibships need not be exclusively of one sex.

Davison (1973), in a survey in the Oxford area, ascertained a large number of families in which there were at least two severely subnormal sibs. Among 141 such families in which no specific diagnosis could be made there were 50 containing affected males only and 20 with affected females only, a substantial excess of those with males. Nevertheless, analysis suggested that there were not only families in which males only were at risk but also some in which females only were at risk. Among families with males only were many with pedigrees strongly suggestive of sex-linkage or limitation (Fig. 5).

I have not attempted to give an exhaustive account of the causes of familial mental defect, which would have included transmitted chromosomal anomalies and such environmental causes as lead poisoning (which could affect the children in a household), but to draw attention to some patterns of disease that might be expected to occur. For their detection it is necessary to record family data, including information about parental and grandparental

consanguinity. It is, of course, easy to pick out pedigrees that fit in with some expected pattern because sooner or later almost any pattern will crop up by chance. But the systematic collection of families might lead to the detection of a significant number of families demonstrating features characteristic of certain classes of cause and help to reduce the at present large proportion of subjects with mental defect of unknown aetiology.

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## Penrose's Work and Views in Relation to Anthropology

By N. A. BARNICOT

Lionel Penrose's work was essentially concerned with medical genetics and, as this audience is well aware, especially with mental defect. He very seldom published in an anthropological journal, and on the few occasions when he mentioned anthropologists in his writings his remarks were not very complimentary. However, those of us who are in the business can take comfort from the fact that these remarks were generally aimed at an earlier generation of anthropologists who had failed to benefit from what human genetics already had to offer in the years before World War II.

It may therefore seem that I have chosen an unpromising theme for my talk. But when I remember how much I learned from Penrose during a happy association lasting some twenty years, I feel glad to make the attempt. I shall mention various instances in which his studies impinged on anthropology, but perhaps the main point is to be found firstly in the nature of his approach to his own work, and secondly in the changes that have come about in anthropology through the influence of population geneticists like himself. He saw the problems of inherited disease in an evolutionary perspective and as part of the wider problem of human variation in general. This immediately points to the connections I have in mind. Traditionally, anthropology has been concerned with the remote evolutionary history of man and with the differences between present-day populations, many of which are the terminal products of this evolutionary process. It is true that anthropologists were not as a rule interested in disease, feeling that 'normal' man was their province; though a few inherited aberrations, such as albinism, excited their attention in the eighteenth century when the subject began to develop, and in those days medicine was the normal route into the biological sciences. In

the light of population genetics the distinction between normal and abnormal has become, in a sense, more blurred. We realize, for instance, that some genes which produce severe defects when present in double dose may be harmless or even beneficial when the individual carries only one of them. So it can be confusing to think of genes as unconditionally 'good' or 'bad'. This is a theme to which Penrose often returned, particularly in his criticism of overconfident eugenic proposals.

Perhaps I ought to explain that when I speak of anthropology I mean the biological side of the subject. Most people are vaguely aware that there are two kinds of anthropologist, one of whom is believed to measure skulls and the other to describe the curious habits of exotic peoples. This characterization may have been apt fifty years ago, but it is inadequate today. Nevertheless, some such occupational division does exist and demands different professional training and skills. Clearly the division is not absolute, since both branches study the human organism. The way people behave can affect the genetical constitution of populations; for example, mating customs influence the flow and distribution of genes. Conversely, the possession of certain genes can have repercussions in social life, as most black-skinned migrants have reason to know.

I do not think Penrose had much taste for the more erudite writings of social anthropologists, but he was sometimes delighted by popular accounts of the way primitive peoples live, such as Bridges' story of his experiences among the Indians of Tierra del Fuego (1) and Jenness on the Eskimos of Hudson Bay (2). Perhaps he felt, as many of us may at times, that scholars often excel in making fascinating material tedious. His pleasure in these glimpses of unsophisticated peoples was one facet of his interest in human oddity in general and of the

wide sympathy that illuminated his dealings with mentally deranged and retarded patients. He was always wary of rigid and overconfident attitudes of mind, and he may have enjoyed the discovery that other cultures do not always share our assumptions and can jolt us out of complacency if we are receptive.

To return to my main theme: anthropologists who work on the biology of living populations have first to describe the differences between them. They have to consider whether these differences are due to genes, to the effects of environment during a lifetime, or, as may often be the case, to some interaction between the two. From an evolutionary point of view the genes are of paramount importance, since it is the genes that are transmitted from one generation to the next; so anthropologists must try to explain how the observed patterns of gene distribution in the world came about. Unless they are dealing with skeletal variations they are less fortunate than the palaeontologists, since they lack direct fossil evidence of what earlier populations were like. Since relevant historical records are usually meagre, they have to proceed more deductively, using their knowledge of what genes do today and applying theoretical concepts worked out by geneticists skilled at algebra.

Inherited differences between populations are generally a matter of degree. They can be summarized as averages of various measurements or as frequencies of discrete traits such as blood groups. Populations are not composed of identical individuals; all are very variable. Many populations are large, so that we can only characterize them by taking a relatively small and, hopefully, random sample. It is therefore evident that in the collection, description and comparison of data we are obliged to use statistical methods. The development of these methods owes much to Galton and later to Karl Pearson and R. A. Fisher. Galton's name is commemorated in the chair at University College which Penrose occupied as Fisher's successor. Penrose had a strong sense of the history of his subject (3) and of the traditions of the Galton laboratory (4), and he found it easy to carry on the biometric tradition because he had an outstanding flair for the analysis of

numerical data. Even today it is probably unusual for a student with mathematical leanings to take up medicine, and especially psychiatric medicine. I imagine it was even rarer when Penrose was a young man. For a long time the biological sciences have tended to be the refuge of the innumerate, but genetics is a branch of biology with obvious scope for mathematical skill. This is particularly true of some aspects of human genetics, because breeding experiments are not possible and the analysis of gene segregation in pedigrees and the detection of gene-linkage require statistical reasoning. The need for such statistical analysis and the dangers of being deceived by artefacts of sampling were clearly appreciated by Penrose in his Buckston Brown Prize Essay of 1933 (5).

Penrose did on occasion turn his mathematical ingenuity to problems that arise in anthropology. One example has to do with classification. If, say, a skull is unearthened, we may ask whether it should be assigned to one or other of certain known populations. This question can best be answered if we take into account not merely one measurement but several. Fisher had devised the method of discriminant analysis to cope with this situation, but in the days of mechanical calculating machines the computational labour was heavy. Characteristically, Penrose sought a simpler procedure (6), believing that biological data are often not accurate enough to justify rigorous but lengthy methods. He followed this up by considering the related problem of measuring the degree of difference between a number of populations each of which has been described by a battery of measurements or of gene frequencies. Mahalanobis and Rao had already tackled this problem, but again the computational difficulties were formidable. Penrose showed, using examples from anthropological data, that closely similar results could be achieved much more rapidly (7). These excursions into mathematical taxonomy were probably not stimulated by anthropology but by the fact that similar problems arise in classifying diseases. Indeed the methods of factor analysis, which were so dear to some schools of psychology, have much the same aim. When Penrose did this work we were on

the threshold of the era of electronic computers which can handle the more complex methods at amazing speed and are now asked to do so almost as a routine. The value of these moronic monsters is not in doubt, but they are not a substitute for thought. For this reason Penrose viewed them with some suspicion, though he made use of them in some of his later work. He preferred simple methods which enabled him to see what he was doing.

I have mentioned classification. Anthropologists, following the lead of botany and zoology, have often tried to classify mankind into races. In these latter sciences the word is more or less coterminous with subspecies, and although the subspecies concept has been criticized the term race is not disreputable. In the human context it has been a source of endless misunderstanding and bitter controversies. The populations of various geographical regions obviously differ to varying degrees in visible features and in the frequencies of many genes; but the pattern of this variation is complex and does not lend itself to a useful subdivision into discrete groups. Penrose disliked the term race and even more the opinions of racists who assert the superiority of certain populations, usually their own. In his comments (8) on the Statement on Race, issued by Unesco in 1951, he made the sensible suggestion that it would be better to substitute the more neutral term population. A population could then be described by geographical location, political affiliation, religion or whatever might be appropriate for the work in hand. The erroneous implications that have grown round the word race would thus be avoided.

Some inherited diseases, such as sickle cell anaemia, Tay-Sachs disease and Down's syndrome, show curious geographical or ethnic variations of incidence. Penrose was fully alert to the interest of these facts and urged anthropologists and others to collect more information; but he also liked to view genetical change as a process involving the whole human species (9), especially today when communication technology has swept away so many barriers. This led him to the idea of working out the frequencies of genes for the world as a whole, taking into account the sizes of different

populations. He did this for the ABO blood groups, for which the data are sufficiently abundant, and he suggested that the peculiarities of particular populations could best be expressed by comparing them with these world frequency values (10). He felt, with some justification, that anthropologists had often paid too much attention to small, specialized populations to the point of neglecting the bulk of mankind.

In the early part of this century workers like Garrod and Bateson were busy seeking examples of clear mendelian gene segregation in man. They found them in certain rare diseases which anthropologists tended to ignore because they were so infrequent. Meanwhile Galton and his followers were studying the inheritance of metrical traits, such as stature, that do not show segregation and were at that time held to refute Mendel's theories. This biometric school had natural affinities with anthropology, which had long relied on body measurements for comparing populations. Perhaps this is one reason why mendelian genetics was slow to penetrate anthropology and made little progress before the ABO blood groups were introduced to the subject in 1914. Today the position is very different, and thanks to the advances in biochemical genetics we can study a whole host of simply inherited variations of enzymes and other proteins. Penrose was quick to appreciate the value of Garrod's work on inborn errors of metabolism and Fölling's discovery of a biochemical defect in phenylketonuric imbecility, and he enthusiastically promoted biochemical studies at the Galton laboratory. Nevertheless, there are many medically and socially important human qualities that cannot yet be described in terms of particular genes with specific biochemical effects; and so Penrose continued to pursue various lines of biometric work in the Galtonian tradition, using methods of correlation analysis on twins and other relatives. His work on the causes of variation in birth weight (11) is perhaps the best known of several examples. He was a great believer in the value of measurement, and he himself measured the heads (12), hair colour (13) and palm (dermatoglyphic) patterns (14) of mentally defective patients. Later on, when cytogenetics

became so important in the study of mental defect, he was active in measuring chromosomes with the aim of identifying each member of the human set (15).

The size and shape of the head, hair colour and dermatoglyphic patterns are classical anthropological characters, but Penrose's interest in them did not come from this source but from their relevance to certain kinds of mental defect. However, as he emphasized, the study of the abnormal is only meaningful against the background of variation in the general population. In investigating hereditary influences the incidence of a condition in relatives must be compared with that in the population at large; or again, in studying whether a particular gene affects susceptibility to certain environmentally induced diseases the frequency of the gene in a sample of patients must be compared with that in the normal population from which the sample was derived.

So Penrose's absorption in the problems of inherited disease naturally led him to consider the causes of variation in the normal population, and this interest he shared with genetically orientated anthropologists. His work on the dermatoglyphic patterns on the hands and feet is a case in point. It is well known that these show characteristic deviations in Down's syndrome and in various other conditions due to chromosome misbehaviour. He encouraged work on the inheritance of the normal patterns and in his last years devised a new method of classifying them (16). He came to it by considering how these patterns are formed in the embryo and reached typically ingenious conclusions based on topology, a branch of mathematics well-suited to the study of how parallel lines can cover complex surfaces (17).

Penrose's mathematical bent must have made it easy and congenial for him to assimilate the work of Fisher, Haldane and Wright who were laying the foundations of the genetical theory of evolution in the 1920s and 30s. Evolution can be regarded as a process of gene frequency change in populations. Gene variants are continually being injected into the population by mutation. Many of these mutations lower fitness in the darwinian sense and are rapidly eliminated or lurk around at low frequencies in

the heterozygous state. In some instances these heterozygotes, who carry a single copy of the gene in question, enjoy a selective advantage in certain environments. The frequency of the gene then becomes stabilized at an equilibrium level. In very small populations unfavourable genes may reach quite high frequencies and favourable ones may be lost merely by chance. In terms of the human life-span the action of natural selection is very slow, often taking tens or hundreds of generations to produce appreciable changes. These, in very crude outline, are some of the principles which emerged from this important mathematical work and which influenced Penrose's thinking profoundly. In the course of time they also influenced anthropology, so that today the boundaries between much of this subject and population genetics are nebulous or non-existent.

Penrose, working on the disease epiloia (18), was one of the first to measure the mutation rate of a human gene, and later on he was involved in discussions about the likely effects of mutagenic atomic radiation on the incidence of genetic defects (19).

The picture of the present human condition, with its ills and imperfections, as a product of natural selection recurred in many of his papers (20), whether on mental defect (21), congenital malformations (22) or chromosome anomalies (23). The idea that genes involved in the production of disease might be held in approximate equilibrium, due to past or present selective advantages of the heterozygotes, was one that he found particularly attractive (24). In arguing against eugenists he constantly emphasized that human populations, in their genetical structure, are more like wild species than like farmyard animals. Their genetical structure had been achieved very slowly by natural selection, and in our present stage of ignorance it was foolish to advocate wholesale interference with it. A notable example was his idea that variation in intelligence, in so far as it is due to genes, is a balanced situation in which the subnormal is a natural and necessary component (25). It was therefore no surprise to him when the decline of national intelligence which had been predicted from the observation that the less intelligent are apt to be more fertile

was found not to have occurred (26). In any case he himself was too intelligent to suppose that intelligence tests are an accurate measure of genetical endowment. He pointed out the analogous case of stature, which might also have been predicted to decline but had in fact increased in many countries, due no doubt to a more favourable environment. Nor was he satisfied with the view that civilization is leading to genetical decay because natural selection has ceased to act and weaklings are thus being preserved. Civilization, he thought, had changed the direction of selection, often in unexpected ways, as we see when new drugs reveal previously hidden inherited susceptibilities. As Professor Fraser has shown in his paper in this symposium, eugenics poses some quite complicated scientific and ethical problems. Penrose's attitude to these was always cautious and humane. He liked to cite the sample of the severe inherited disease, sickle cell anaemia, which may be expected to decline slowly in frequency as malaria is eradicated. The reason is that malaria seems to be the major selective factor keeping the gene at high frequencies in some parts of the tropics. This is a good illustration of how a public health measure, taken for quite different reasons, can have unforeseen, and in this case beneficial, genetical consequences, without anyone having to be sterilized. Admittedly, in such a case the rate of decline of the gene frequency would be too slow to satisfy impatient eugenists, and, as Penrose realized, other methods such as direct treatment that could circumvent the bad effects of such a gene might offer preferable solutions.

His remarks on these and other matters of social importance show that he was never one to be attracted by superficial or fashionable explanations or to respect opinions merely because they were authoritative. He knew that only by the patient collection of evidence and critical analysis of it could some insight into the complexities of human biology be achieved.

In concluding this inadequate survey of the ways in which Penrose's work had a bearing on anthropology, I should like to thank the Royal College of Psychiatrists for giving me the chance to pay tribute to a deeply thoughtful and original scientist and a very good friend.

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## Some Experiments of Nature with Sex

By PAUL E. POLANI

Professor Penrose was a human geneticist but above all a human biologist interested in all aspects of man's adaptation and behaviours. However, I need not remind you of the fact that his interests were wider. They were, among others, with the field of biology itself. This interest was one reason why he was particularly delighted with some of the discoveries made on human chromosomes and their anomalies, and he shared very abundantly in the work and in the excitement of these discoveries.

I am going to discuss today some of the experiments of nature, with sex, and some of the lessons and problems relating to these. My survey will be from a general viewpoint, but with a special bearing on sex determination and early differentiation in man, a subject which I often had the privilege of discussing with Professor Penrose. His counsel, often given in the form of a simple and casual remark, was ever present, and his curiosity and ingenuity were continuously stimulated by the factual discoveries in the field of human sex chromosome anomalies and by the hypotheses derived from them. At some of these hypotheses he looked with approval, at others with overt scepticism; at all, however, with the interest of a biologist.

An important genetic and biological finding—though one that was practically lost sight of in the face of the many medical discoveries in human cytogenetics in the same year—was the discovery in 1959 of the sex-determining mechanism in man and of the importance in this of the Y chromosome. Until then it had been more or less tacitly accepted that human, and possibly mammalian, sex determination in general followed the *Drosophila* pattern. In the fruit fly the Y is not involved in sex determination, i.e. it is not required for testis formation, the essential sex determining act in mammalian embryogenesis, as we know from Jost's em-

bryonic castration experiments. In line with this the XO *Drosophila* is a male, albeit sterile, and the XXY a female. Before the XO and XXY conditions were discovered in man it was not considered that the human Y chromosome, the existence of which was accepted finally through the work of Koller, was directly involved in male determination. There were, admittedly, precedents for such a role of the Y chromosome, in plants (Westergaard, 1958) for example; and cytological and genetic evidence had, a few years earlier, suggested the possibility that XO subjects in man were females, unlike the situation in *Drosophila* (Polani, Lessof and Bishop, 1956) and thus that sex determination in man might turn out to be different from that in the fruit fly. The confirmation of this suggestion had to wait till 1959 (Ford, Jones, Polani, de Almeida and Briggs, 1959) when it was shown that sterile females with Turner's syndrome were XO, and that a Y added to the two Xs made a male, albeit sterile, with Klinefelter's syndrome. Thus a male-determining role was established for the human Y; absence of the Y made a female and presence of the Y a male. Almost at the same time, and independently, it was found that XO was female also in the mouse (Welshons and Russell, 1959), and later that XXY was a male in this species also (Russell and Chu, 1961; Cattanaach, 1961). But the XO mouse, in contrast to the XO woman, was normal and fertile. Furthermore it was shown in man that the Y chromosome was a male determiner irrespective of the number of Xs present. The reason for this, we now know, is more in the weakness, if I may call it that, of the X than in the strength of the Y. This provided collateral support, but the apparent normality of the XO mouse was the experiment of nature on which Lyon (1961) initially based her single active X hypothesis, the mosaic phenotype of female mice heterozygous for

X-linked coat colour genes being the other contributing observation. In keeping with this hypothesis the genes that have been tested seem all to share in inactivation, but Xg in man seems anomalous. This locus behaves as if it escaped inactivation at least on structurally normal X chromosomes (Lawler and Sanger, 1970); yet, paradoxically, it seems to share in inactivation when it is located on structurally abnormal Xs, another curious experiment of nature (Lindsten, Fraccaro, Polani, Hamerton, Sanger and Race 1963; Polani, Angell, Giannelli, De La Chappelle, Race and Sanger, 1970b).

To return to XO's, it was shown later on that in fact the XO mouse differed only quantitatively from the XO human; like the human XO, the XO mouse too has few germ cells, but the reduction is not as drastic as in man, and it often is prenatally lethal, though, again, less often than in man (Morris, 1968). Thus it became clear that the second X, even if genically inert, according to Lyon's postulate, is nevertheless essential or very important to proper germ cell formation and ovum maintenance; it may also put the brakes on the speed of cell division and thus influence development (Angell, 1969; Barlow, 1972 and 1973). All in all the second X seems less essential in somatic cells and less important after embryogenesis, as some mammals whose somatic cells are normally XO clearly demonstrate (Ohno, Stenius and Christian, 1966). And even man, or at least woman, seems to jettison one X at least in some body cells and late in the course of development, the aneuploidy of ageing (Court Brown, Buckton, Jacobs, Tough, Kuenssenberg and Knox, 1966; Hamerton, Taylor, Angell and McGuire, 1965).

As for the location of the maleness factor or factors, some experiments, of nature with different Y chromosome deletions in man suggest (and it is no more than a suggestion) that this system may be in the short arm of the Y (Jacobs, 1969; Angell, Giannelli and Polani, 1970). This arm, incidentally, is the 'associating'—I dare not use the word 'pairing'—segment of the Y with the X at meiosis. If the sex system is in the short arm, experiments of nature suggest (Angell *et al.*, 1970) that it is not near the very end of this arm but rather nearer the centromere,

and there is additional support for this view (Krmptotic, Szego, Modestas and Molabola, 1972).

Thus the Y carries a gene or factor or system for maleness. There is a view that the effect of the Y chromosome in making a testis might be a general rather than a specific genic effect on cell growth rate (Mittwoch, 1973). The function of the male factor in essence would be to channel the non-differentiated embryonic gonad to differentiate into a testis, and this committing act would be the primary, embryogenetic sex-determining event from which all somatic and most other sex differences stem. Recent studies in the rat by Jost would suggest that the very first change in the male embryo gonad is a swelling of the Sertoli cell-line present in the undifferentiated gonadal blastema, starting close to the tubules of the mesonephros (Jost, 1972). These cells would subsequently aggregate and form the seminiferous cords and enclose the germ cell, an event with far-reaching consequences on male as opposed to female meiosis. In man, the first visible change in the male gonad is probably as early as at about six weeks. Soon after this the other characteristic feature of testis development can be seen; the paucity of cortical cells with the consequent formation of an albuginea, and a week later, i.e. by 7 or 8 weeks (Jost, 1973), the characteristic interstitial, androgen-producing Leydig cells appear (Pelliniemi and Niemi, 1969). It may be that they differentiate under control of the seminiferous cords, as they do not need gonadotropic influences for this (Picon, 1967).

Having established that the major sex-determining genes, or factors, were on the Y chromosome in man and other mammals, it was expected, rather naively perhaps, that the matter ended there. But there are some facts concerning gonadal sex reversal which need interpretation and would seem to falsify this view. Nature's experiments, this time, are with the goat, with strong support from the mouse and some from man, and they suggest that autosomal genes may be involved in the control of testis formation during embryogenesis and may, if mutated, take over more or less efficiently a male-determining role from the Y chromosome. The facts concerning the goat seem quite simple and straightforward. Following the

observation that intersexuality is quite common in XX goats, that it is recessively inherited and that when the sex ratio was studied, the intersexes seemed to be genetic females (Eaton and Simmons, 1939), it was shortly thereafter (Asdell, 1944) established that the genetic character hornless or 'polled', i.e. the hornless condition, which in the goat is dominantly inherited, is invariably associated with this type of intersexuality. In other words the dominant gene for polled, which apparently only affects horn production in single dose, when present in double dose affects sexual development. The dual effect on horns and on sex was attributed to either pleiotropy of this one gene or to the presence of a pair of closely linked genes, one for polledness and one for sex. It was later proved that the sex chromosome complement of the intersexual animals was indeed XX (Nes, Andersen and Slagsvold, 1963; Hamerton, Dickson, Pollard, Grieves and Short, 1969), as in normal females. Genital development varied somewhat. In most intersexual goats, the gonads were testes in appearance and hormonal function, but sterile, and only very rarely ovotestes, while the genital tract could be frankly male, with external or scrotal testes, or somewhat intersexual, or more feminine, though masculinized, with intra-abdominal testes and a mixture of male and female internal genitalia. Clearly the mutant recessively acting gene controlling sex in the goat is autosomal.

In man there is a seemingly parallel condition and the XX male was described first it seems in 1958 (Ford, Jacobs and Lajtha, 1958) and there are probably by now some 50 XX males reported (see La Chapelle, 1972). I have (Polani, 1972) estimated the prevalence of the condition at about 1 in 45,000 males, but a higher frequency at birth, however with wide confidence limits, has also been given (Ratcliffe, Stewart, Melville, Jacobs and Keay, 1970). These males are sterile (spermatogonia may be found in some) and their testicles are small and histologically generally like those in Klinefelter's syndrome or in the syndrome of germinal cell aplasia. Externally and internally the genital tract is fully male.

As for the origin of the condition in man,

which may well be heterogeneous, there are five formal possibilities. The first is that we may be dealing with a genetic situation, as in the case of the goat; but there are only two examples of the occurrence of another sib with a sex chromosome anomaly possibly related to but certainly not identical with the XX male (Berger, Abonyi, Nodot, Vialatte and Lejeune, 1970; Kasdan, Nankin, Thoen, Wald, Pans and Yanaihara, 1973).<sup>\*</sup> In addition, there is no consanguinity among the parents, and some could be expected if the XX male condition is as rare as we think. So a recessive gene seems unlikely. Nevertheless, a proportion of these XX males could be due to a single dominant sex gene mutation, and the sterility of those affected will influence the detectability of transmission.

The next two possibilities are both concerned with the presence of a Y chromosome in a small proportion of cells or in cells that cannot be or have not been sampled. For example, an XX male may be derived from an originally XXY zygote by loss of the Y chromosome during early blastomere division, and its retention in the cell line may be concerned with testis differentiation during embryogenesis. There are one or two examples of XX males where an extensive study seems to have shown such a very minor cell line (La Chapelle, 1972). If this view is correct, some at least of the XX males could have both Xs of maternal origin, as many of the XXY males would seem to have because the nondisjunctional error that causes them is often in oogenesis. In confirmation of this, the Xg sex-linked blood group findings in three<sup>†</sup>

<sup>\*</sup> Human XX true hermaphrodites—these are also rarely found in polled homozygous goats—have been known to occur in families, suggesting the possible action of a mutant (? autosomal) gene (see Goldstein and Wilson, 1973), and it is not excluded that some examples of XX true hermaphroditism (the commonest sex chromosome complement in this condition) may be aetiologically related to the XX males.

<sup>†</sup> In 21 families both parents and their XX sons were Xg tested. In three there could have been direct evidence on whether the paternal Xg<sup>a</sup> allele had been transmitted to his XX son, and in two of them it was not. It can be estimated that a further 7.0 or so families might have been informative in respect to 3.5 of the 7.0 XX sons, and one of them showed failure of transmission of the father's Xg<sup>a</sup>. One may conclude that failure of transmission of the fathers' Xg alleles to their XX sons may not be an infrequent event.

families, assuming no illegitimacy, suggest, *prima facie*, that both Xs are maternal because the three fathers have not transmitted their Xg<sup>a</sup>, or 'positive allele', to their three XX sons who are Xg(a-negative) (Xg(a-)); and in one family the Xm sex-linked serum group also behaves similarly (Sanger, Tippet and Gavin, 1971; La Chapelle, 1972). There is, naturally, another way for the presence of two maternal Xs: mitotic non-disjunction of an XY zygote, a cumbersome way to make an XX male. A second view of the hidden Y cell-line hypothesis is that the minor cell line with the Y could be XY and the zygote a dispermic chimaera resulting, for example, from the fusion of an XX and an XY original zygotes, a sort of twinning in reverse, and the odd XX male could well be of this type (Berger, Abonyi, Nodot, Vialatte and Lejeune, 1970).

Finally, there are two ways whereby not the whole Y but only the genetic factors for maleness from the Y chromosome may be transferred to another chromosome and thus account for the masculinization of an XX subject. The first could be an accidental translocation or an interchange, as postulated in respect to Xg (v.i.) by Frøland (Frøland, Johnsen, Andresen, Dein, Sanger and Race, 1963) and Sanger (Sanger, Race, Tippet, Gavin, Hardisty and Dubowitz, 1964), the male factors from the Y being translocated on to the X or to an autosome (Ferguson-Smith, 1966) by some breakage reunion event affecting both the Y and the recipient chromosome. If such a translocation does occur, chromosome banding evidence suggests that the transfer of Y material is discrete (George and Polani, 1970; Caspersson, De La Chapelle, Lindsten, Schröder and Zech, 1971). In the case of a translocation, if the recipient chromosome were the X chromosome, the breakage might involve, or occur proximally to, the Xg locus on this chromosome, and as this would happen on the father's side his X with the maleness factors from the Y, but minus the Xg locus, would be transmitted to his offspring and produce a son whose only source of Xg genes would be maternal; the findings in the three families quoted above would also fit this origin of the XX anomaly.

The other way for the transmission of

masculinizing genes would be if crossing over regularly occurred between X and Y, i.e. if there were a terminal pairing segment between the X and the Y chromosomes. Of course, evolution of these chromosomes has resulted in suppression of crossing over between X and Y of the essential sex differences, but the efficiency of the suppression could be variable, particularly so in some families, and if the Xg group locus were near the hypothetical pairing segment in both X and Y, and the key sex genes it too could become involved in the gene transfer between X and Y, predictably with a higher frequency than the sex genes. On present evidence (Sanger, Tippet and Gavin, 1971) this might well be the case. There are, naturally, some complications such as having to account for an apparent 'linkage disequilibrium' of Xg in this situation, but the crossing over theory could make the Xg locus something special which might account, for example, for its behaviour in relation to X inactivation. It would also fit in with a model which I proposed some years ago (Polani, 1962) of the make-up of the sex genes and blocks at the ends of X and Y chromosomes to take account of a single but interesting experiment made by nature and interpreted by Armstrong and Race (Armstrong, Gray, Race and Thompson, 1957; Harnden and Armstrong, 1959). Disregarding the possibility that a mutant gene might be responsible for the masculinization of the XX subjects under discussion, it has been calculated (Côté, 1973) that the odds in favour of an XXY as against an exchange derivation are as 3.4 to 1.

A final point to bear on the location of a testis development controlling factor outside the Y is an autosomally inherited dominant condition in the mouse which causes XX females to develop into phenotypic males with testes, but sterile, i.e. it causes sex reversal. The sex-reversed factor, *Sxr*, does not affect the carrier male and is fully penetrant. It was discovered accidentally by Cattanaach (Cattanaach, Pollard and Hawkes, 1971) and behaves like a dominant gene. Because of its dominant effect it seems different from the type of mutant gene which causes sex reversal in the goat; and, though there is no evidence to support this contention, the *Sxr* may, remotely, be the segment of the Y

with the male factors translocated onto an autosome.

Next, I should like to consider briefly an old experiment of nature, one that has intrigued many since it was observed by farmers centuries ago and described, originally probably, by John Hunter in 1779: the freemartin or barren intersexual cow. Actually, the retrospective diagnosis by Short of a famous animal described by Hunter as a freemartin is not freemartin but testicular feminization (Short, 1969).

A freemartin is a more or less masculinized cow, parabiocotic co-twin of a normal bull. The condition, which, though not exclusive to ungulates, is seldom met in other mammalian orders, e.g. primates, is related to fusion of the twin choria and the presence, an absolute must, of vascular anastomoses between twins (Tandler and Keller, 1911; Lillie, 1916) with hormonal, and sometimes cellular (Ohno, Trujillo, Stenius, Christian and Teplitz, 1962; Ohno, 1969), exchange. The freemartin gonad is small and often contains sterile seminiferous tubules, while the Müllerian, or paramesonephric, derivatives are either completely or almost completely absent, the Wolffian ducts and derivatives are generally present, and the clitoris is normal or somewhat hypertrophic, particularly in those freemartins in which the testis is relatively well developed. The chronology of the abnormal freemartin development has been studied in the natural and the superovulation-induced freemartin by Jost and colleagues (Jost, Vigier, Prépın and Perchellet, 1973). The characteristics are, first, regression of gonadal growth and of Müllerian derivatives synchronously with testis development and Müllerian regression in the bull twin; secondly, the frequent formation of seminiferous tubules in the potential ovary subsequent to such events in the male twin's gonad; and, thirdly, the hypertrophy of the Wolffian derivatives in those cows that have the 'better' testes (Jost *et al.*, 1973). The general idea that has emerged from the studies of Jost and his colleagues is that we may be dealing with hormonal effects, firstly external from the bull twin's testes, and secondly internal, derived from the cow's own transformed gonad.

The next two natural experiments bear on these points. The first, testicular feminization,

is a genetically determined condition which affects about 1 in 60,000 males. The affected males appear outwardly as females and completely behave as such. However, they are sterile, have no menses after puberty, and have what one might call 'sexual baldness', i.e. absence of pubic and axillary hair. Internally they generally carry sterile testes, which may, however, sometimes be found in inguinal hernias; these produce testosterone in near normal amounts, as expected from their position, but there are no internal male, or for that matter, female ducts. Thus there is no vas deferens, no seminal vesicles, no uterus nor cervix, and the vagina is a blind-ending pouch. In spite of the normal testosterone production, or any additional administration of it even in large doses, these subjects are never masculinized, but tissue conversion of endogenous testosterone into oestrogen, oestrogenizes them. The disorder is transmitted by unaffected carrier women to half their sons on an average, who are transformed into apparent females, while half their daughters are carriers of the gene like themselves. Formally X-linkage is one possibility, the alternative being sex-limited inheritance. The condition has been much clarified by the discovery of a testicular feminization mutation in the mouse, *Tfm*, by Lyon and Hawkes (1970). In the mouse, the gene is on the X, in its middle in fact, and it is fair to assume that testicular feminization is X-linked in man also, if we accept the principle of the tendency to conserve linkage groups and gene clusters in the course of chromosome evolution (Ohno, 1967). In addition, with the mouse, experimentation on the nature of the defect has become possible, and it is now clearly established that the defect is one of unresponsiveness of target organs to testicular androgens, testosterone and its derivatives, as Wilkins postulated years ago from the failure of affected men to respond to testosterone. One major point is that in the mouse it has been possible to test a variety of organs which normally respond to testosterone, and they have all proved unresponsive. Possibly one of the most interesting points revealed by the mouse was the homology of the proximal renal tubules to the Wolffian ducts and the failure of both to respond post-

nately and prenatally to testosterone or its intracellular derivatives. The normal response is an increase of cellular RNA and protein synthesis, and in some organs there is subsequent hypertrophy and cellular proliferation (Ohno, Tettenborn and Dofuku, 1971). Other organs have also been studied and proved insensitive, for example the hypothalamic-pituitary axis, the submaxillary salivary gland and, by direct experiments, again the embryonic Wolffian ducts and urogenital sinus in the mutant mice (Ohno, 1973). So the concept of a universal resistance to testosterone seems valid. An interesting point arises from considering how testosterone acts and how it is taken in normally by target cells. In general, target cells responsive to steroids carry receptor proteins which specifically bind these hormones, testosterone in our special case. In the mouse the specific testosterone receptor may have a molecular weight of 70,000 and be tetrameric (Ohno, 1973). Following interaction with testosterone of the limited number of molecules of the specific receptor protein, these could undergo an allosteric change, move into the nucleus, associate specifically with different components of the nuclear chromatin, and thus exercise the testosterone effect. Testosterone itself undergoes changes in the cell, first to the more potent androgen dihydrotestosterone, which is then metabolized to androstandiol. (see e.g. Polani, 1970a). The crux of the matter in the testicular feminization mutation seems to be that there is absence (Bullock and Bardin, 1972) or abnormality (Ohno, 1973) of androgen binding by the mutant receptor protein, which thus cannot produce the effects of testosterone stimulation of the target cells. These effects may normally be related to direct or indirect binding of the testosterone-triggered receptor protein to DNA, or to the precursors of messenger RNAs, and possibly, according to Ohno (Ohno, 1971), may activate RNA polymerase I. This seems to be concerned with transcription of the ribosomal cistrons and hence to be involved in providing the mechanism for protein synthesis. Thus the mutation at one locus on the X chromosome would alter the responsiveness of target cells and produce a state which, in parallel with what happens in bacterial systems, Ohno has called

'non-inducible'. According to this view the normal male embryo, acting in response to testosterone, would be the 'induced sex', and the normal female embryo, with insufficient testosterone to trigger the mechanism, would represent the 'non-induced' state of the same regulatory system for sex differentiation. It is perhaps of some interest that it is suggested that testosterone may well act on the Wolffian and renal systems not through the circulation but by canalicular absorption, possibly by pinocytosis through a ciliary action, and that, if so, deficient ciliary action may underlie the failure of the vas deferens to form properly in fibrocystic disease of the pancreas (Ohno, Tettenborn and Dofuku, 1971).

In testicular feminization not only are there no internal Wolffian derivatives, and this is explained as an effect of testosterone resistance, but Müllerian derivatives are also missing as in normal males. For an explanation we must turn first to Jost and then to consider two final experiments of nature. Jost (Jost, 1947) has suggested that another foetal hormone, from the testis, is responsible for Müllerian regression, and this activity seems to be present at least in the foetal testes of rabbit, calf and man, while testosterone has no such effect on the Müllerian ducts. It seems that only the foetal testis makes this paramesonephric duct inhibitor (Josso, 1972a), that it is produced by cells of the seminiferous tubules, probably the Sertoli cells (Josso, 1973), and that it may have a molecular weight of over 15,000 (Josso, 1972b), and thus that it cannot be a steroid but may be a protein, possibly a foetal protein. With the details of the freemartin effect in mind, we could envisage this second foetal testicular hormone as influencing gonadogenesis itself and inducing some of the characteristic changes in the gonad which makes a foetal testis a testis. Be that as it may, there is a condition in man in which Müllerian structures persist side by side with otherwise relatively normal male development, though failure of testis descent may be present. The condition has been described in some 60 patients and in six pairs of sibs (Brook, Wagner, Zachmann, Prader, Armendares, Frenk, Aleman, Najjar, Slim, Genton and Bozic, 1973). It has been suggested that this anomaly



may possibly reflect a failure of the production of the Müllerian inhibitor or a lack of responsiveness to it, and that this error may rest on an inheritable mechanism.

I wish to conclude by summarizing the more important lessons which experiments of nature with sex have taught us. They are: first, that in mammals the Y is the sex *determiner*, namely a male determiner, this being the main sex regulatory system; that, possibly, this system may be a discrete part of the Y; that it may perhaps be on the short arm of the human Y and, if so, nearer the centromere than the telomere; that there are probably other genes involved in this, possibly autosomal, whose mutant alleles may mimic the Y function; that there may, just may, be a pairing segment between human X and Y, near the key Y sex-factor, and possibly near to the Xg locus. Second, that sex *differentiation*, namely male differentiation, may depend on responsiveness to testosterone and similar androgens and require an intermediate, the product of an X-linked gene. Third, that in the absence of a masculinizing effect a female phenotype and gonadal structure are generated, but that, man at least, finds a second X, the so called inactive X, practically indispensable for fertility and for the avoidance of follicular atresia of oocytes. Fourth, that environmental gonadal reversal, in mammals, is difficult to achieve, but that, perhaps, a product of the foetal testis, a second hormonal secretion, might achieve some of this; that, at any rate, such a special foetal testicular hormone could be essential to female germinal tract involution; that this latter is another element which supports the concept that the mammalian body structure, as well as the gonadal make-up are feminine unless altered by what have been called, in another context, inducible modifications.

These and many more lessons and hypotheses can be gleaned from the few genetic experiments of nature with sex that I have reviewed, and there are many more such experiments of nature which I have not discussed. Many of the conclusions are tentative and some may well be disproved. If there are errors I submit that they lie in our interpretation of the results, not in the nature of the experiments themselves.

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## Social Aspects of the Battered Baby Syndrome

By SELWYN M. SMITH, RUTH HANSON and SHEILA NOBLE

In spite of increasing interest, the problem of the battered child remains controversial. Some see the problem as a response to stressful social circumstances and society's permissive attitude to violence (23), others view it as primarily a manifestation of parental maladjustment (64).

A vast array of environmental stresses have been regarded as contributory. Some have commented on the frequency of out-of-wedlock pregnancies (2, 58). A high incidence of divorce, separation and unstable marriages has also been reported (30). Social isolation, unemployment and lack of immediate support from other relatives are thought to be important (18, 72). Other factors thought to be predisposing include promiscuity (72), larger than average family size (23), poverty, insufficient education (20), geographical mobility (21, 56) and inadequate housing (2). Paulsen and Blake (44) have cautioned against viewing battering parents as a function of educational, occupational and social disadvantage and have pointed out that most people in deprived sections of the community do not batter their children. In fact some regard social, education, economic and demographic factors as irrelevant (64); instead emphasis is laid on maladjustment resulting from harsh childhood experiences. Baby batterers are not, however, unique in this respect, for the same is said to apply to murderers (16, 35) and other criminals (36).

Previous studies have not considered the issue that some factors may be typical of low social class populations and not particularly characteristic of baby batterers. Nor has the relative importance of the various social stresses been adequately assessed. This paper attempts to reconcile diverging opinions by examining a wide variety of social characteristics and the role of social class.

### SUBJECTS AND METHODS

*Index cases.* Over a two-year period the parents of 134 battered children under 5 years were

studied in detail. Most of the children had been admitted to hospital. All their parents had either confessed to battering or could give no adequate explanation of their child's injuries.

*Control group.* The controls consisted of 53 children under 5 years of age who were emergency admissions and where there was no question of battering. Mother's age, area of residence, and consultants referring cases were also held constant (61).

All parents were seen both at the hospital as soon as possible after the child's admission and at home, and were given standardized psychiatric, psychological and social interviews. In the social interview, questions initially covered child-rearing practices, and subsequently family constitution, occupation, ethnic and religious background, financial circumstances and mother's attitude to the pregnancy and the child, in this order. Accommodation, social life and marriage were covered next, and finally enquiry was made into satisfaction with life in general and into significant worries. Results have been presented comparing index and control samples without controlling for class. (The Appendix gives questions and response categories which are not self-evident.)

The problem of finding a control sample of equally low social class to match the index cases was insuperable. However, it was possible to weight the index sample results equating them for social class of the controls (39). This made it possible to determine whether abnormalities in the index sample were as significant when class was held constant. Details of statistical work on the class control will be published elsewhere, but the results are summarized in the text of this paper.

### RESULTS

#### *Classification*

For 59 index cases (44 per cent) there was a confession of battering from a parent. In 43 (32 per cent) cases the index mother was identified as the perpetrator.



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4. *Brit. J. Psych.* (1971), 119, 230-5. *Ibid.* (1973), 122, 366-9. *Curr. Med. Res. and Opin.* (1974), 2, 78-89. Each Fluanxol tablet contains 0.5 mg. Flupenthixol as the dihydrochloride. Full information is available on request.

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*Marital status*

Of the index mothers 36 (29 per cent) were unmarried, compared with 3 control mothers (6 per cent) ( $\chi^2 = 10.19$ ; d.f. = 1;  $p < .01$ ). In 44 index (35 per cent) compared with 2 control cases (4 per cent) the biological father was absent ( $\chi^2 = 17.17$ ; d.f. = 1;  $p < .001$ ). Table I shows the situation at time of interview. More than half the index mothers (54 per cent) had given birth to their first child before the age of 20, compared with 10.6 per cent in the population at large (49). Twelve index parents (15 per cent) compared with none of the controls ( $\chi^2 = 6.62$ ; d.f. = 1;  $p < .01$ ) had known each other for less than six months before marriage. Among the index group 36 mothers (30 per cent) and 11 fathers (13 per cent) described their marriage or liaison as unsatisfactory. No control parent reported this. This was significant ( $\chi^2 = 17.43$ ; d.f. = 1;  $p < .001$ ) for index mothers only. All these findings held after controlling for class.

*Pre-marital conception and illegitimacy*

Eighty-seven index mothers (71 per cent) compared with 17 controls (33 per cent) had conceived pre-maritally ( $\chi^2 = 19.44$ ; d.f. = 1;  $p < .001$ ). Forty-five battered children (36 per cent) compared with 3 controls (6 per cent) were illegitimate ( $\chi^2 = 15.48$ ; d.f. = 1;  $p < .001$ ). Table II shows the occurrence of pre-marital conception and illegitimacy broken down by age, and compares both with national norms (49). In every age group index mothers have pre-marital pregnancies and illegitimate babies much more frequently. Social class adjustments did not affect these findings.

TABLE I  
*Family situation of index mothers*  
( $n = 124$ )

|                               | No. | (%)   |
|-------------------------------|-----|-------|
| Single and living alone ..    | 19  | 15    |
| Single and cohabiting ..      | 4   | 3     |
| Separated and living alone .. | 6   | 5     |
| Separated and cohabiting ..   | 7   | 6     |
| Separated and married ..      | 7   | 6     |
| Total ..                      | 43  | (35%) |

TABLE II

*Pre-marital conception and illegitimacy rates of index and census mothers by age*

| Mother's age | Pre-marital pregnancy (%) |        | Illegitimacy (%) |        |
|--------------|---------------------------|--------|------------------|--------|
|              | Index                     | Census | Index            | Census |
| 15-19 ..     | 94.1                      | 69.7   | 33.3             | 25.8   |
| 20-24 ..     | 48.2                      | 20.6   | 25.9             | 7.7    |
| 25-29 ..     | 52.9                      | 7.1    | 50.0             | 4.6    |
| 30-34 ..     | 25.0                      | 6.4    | 50.0             | 5.5    |

*Attitude to pregnancy and abortion*

Twenty-three index mothers (20 per cent) were displeased, compared with 3 controls (6 per cent) ( $\chi^2 = 4.32$ ; d.f. = 1;  $p < .05$ ). Fifteen index (13 per cent) compared with none of the controls claimed that their partners were displeased over the pregnancy ( $\chi^2 = 6.14$ ; d.f. = 1;  $p < .05$ ). This finding was not significant when class was taken into account. Fifty-seven index (49 per cent) compared with 19 control mothers (37 per cent) had reservations about the pregnancy, but this was not a significant finding. Fifteen index mothers (12 per cent) and only one control mother (2 per cent) had considered an abortion during the relevant pregnancy, but this difference was not significant (Table III).

*Contraception*

Forty-two index mothers (35 per cent) were using contraceptives, but those who did not expressed a negative attitude significantly more often than did the control mothers towards the future taking of contraceptives (Table III). This remained true after adjustments for social class.

*Family size*

The mean number of children in the index families was 2.3 and for controls 2.0 ( $\chi^2 = 6.62$ ; d.f. = 1;  $p < .01$ ). Forty-three battered babies (32 per cent) were first-born or only children in the family, and 91 (68 per cent) were second or subsequent born children. When family size is taken into account, battered babies were observed to be randomly distributed among the different birth orders (Table



IV). In families of two children the observed proportion of second born was higher than expected ( $\chi^2 = 5.76$ ; d.f. = 1;  $p < .05$ ). For the controls it was also the younger child who was admitted to hospital.

#### *Parents' family size of origin*

The parents' mean family size of origin was 5.6 for index mothers, 4.3 for controls, 4.7 for index fathers and 5.3 for controls. (Statistically not significant, as the apparently larger differences are due to a few very large families).

#### *Family disharmony*

Fifteen index mothers (13 per cent) had low opinions of their partners, as compared with none of the controls ( $\chi^2 = 5.76$ ; d.f. = 1;  $p < .05$ ). Seventeen (15 per cent) admitted that their partners rejected the child, as compared with none of the controls ( $\chi^2 = 5.87$ ; d.f. = 1;  $p < .01$ ). Thirty-one index (27 per cent) as compared with 3 control mothers (6 per

cent) reported that they did not participate in child rearing discussions ( $\chi^2 = 19.39$ ; d.f. = 1;  $p < .01$ ). Rejection and non-participation remained significant after class control. Forty-seven (41 per cent) reported disagreement over child rearing ( $\chi^2 = 19.39$ ; d.f. = 1;  $p < .001$ ) but this particular contrast disappeared when social class was held constant.

On direct questioning about strained relationships within the family a smaller proportion of index, 79 (72 per cent), than control parents 44 (92 per cent), admitted marriage problems ( $\chi^2 = 6.53$ ; d.f. = 1;  $p < .05$ ). Twenty-one index (18 per cent) and one control mother (2 per cent) reported that it was they who took the important family decisions ( $\chi^2 = 6.81$ ; d.f. = 1;  $p < .01$ ), and this held after adjustments for social class. Twenty-three index mothers (22 per cent), as compared with 5 controls (10 per cent), reported quarrels not long before their child's admission to hospital (difference not significant).

TABLE III

*Use of and attitude towards contraception and abortion among index and control mothers*

|                                                   | Index mothers |      | Control mothers |      | Significance (d.f. = 1) |      |
|---------------------------------------------------|---------------|------|-----------------|------|-------------------------|------|
|                                                   | No.           | (%)  | No.             | (%)  | $\chi^2$                | p    |
| Using contraceptives .. .. .                      | 42/121        | (35) | 13/51           | (26) | 1.01                    | N.S. |
| Not using contraceptives and negative attitude .. | 43/79         | (54) | 8/38            | (21) | 10.32                   | <.01 |
| Abortion considered .. .. .                       | 15/121        | (12) | 1/51            | (2)  | 3.48                    | N.S. |

TABLE IV

*Position in family of index and control children*

|             | Index child |    |    |    |   |   |   |   | Control child |    |    |   |   |   |   |   |
|-------------|-------------|----|----|----|---|---|---|---|---------------|----|----|---|---|---|---|---|
|             | 1           | 2  | 3  | 4  | 5 | 6 | 7 | 8 | 1             | 2  | 3  | 4 | 5 | 6 | 7 | 8 |
| Family Size | 1           | 43 |    |    |   |   |   |   | 1             | 28 |    |   |   |   |   |   |
|             | 2           | 13 | 37 |    |   |   |   |   | 2             | 0  | 11 |   |   |   |   |   |
|             | 3           | 1  | 6  | 10 |   |   |   |   | 3             | 0  | 1  | 6 |   |   |   |   |
|             | 4           | 0  | 1  | 6  | 3 |   |   |   | 4             | 0  | 0  | 1 | 3 |   |   |   |
|             | 5           | 0  | 3  | 3  | 2 | 4 |   |   | 5             | 0  | 0  | 0 | 0 | 0 |   |   |
|             | 6           | 0  | 0  | 0  | 0 | 0 | 2 |   | 6             | 0  | 0  | 0 | 0 | 0 | 0 |   |
|             | 7           | 0  | 0  | 0  | 0 | 0 | 0 | 0 | 7             | 0  | 0  | 0 | 0 | 0 | 0 | 1 |
|             | 8           | 0  | 0  | 0  | 0 | 0 | 0 | 0 | 8             | 0  | 0  | 0 | 0 | 0 | 0 | 1 |
| Totals      | 57          | 47 | 19 | 5  | 4 | 2 | 0 | 0 | 28            | 12 | 7  | 3 | 1 | 0 | 0 | 1 |

*Ethnic characteristics*

One hundred and two index cases (76 per cent) were White, 19 were West Indian (14 per cent) and 13 were Asian (10 per cent).

Table V shows that three characteristics differentiated the West Indians from the White index sample. These were absence of biological father, frequent use of physical punishment and rare contact with parents. Biological fathers were absent in only two Asian homes (17 per cent). When compared with the White sample the difference was not significant. Nine of the Asians (90 per cent) had rare contact with their parents, and when compared with the White sample this was a significant difference ( $\chi^2 = 8.09$ ; d.f. = 1;  $p < .01$ ).

*Religion*

Among the index mothers 71 were Church of England (57 per cent), 23 were Roman Catholic (18 per cent), 15 Nonconformist (12 per cent), 11 (9 per cent) belonged to various Asian religions (2 Sikhs, 2 Hindus, 4 Moslems, and 3 unidentified). There were no Jewish mothers, and 5 (4 per cent) declared that they had no religion. Among the index fathers 44 were Church of England (51 per cent), 20 were

Roman Catholic (23 per cent), 2 Nonconformist (2 per cent), 13 belonged to Asian religions (3 Sikhs, 2 Hindus, 5 Moslem, and 3 unidentified). There were no Jewish fathers, and 7 (8 per cent) declared that they had no religion.

Affiliation was nominal for 71 index mothers (58 per cent) and 46 index fathers (61 per cent).

Among the index group 40 mothers (33 per cent) and 19 fathers (26 per cent) reported a personal faith. For the controls the proportions were 21 mothers (40 per cent) and 5 fathers (25 per cent) but when compared with the index group these were not significantly different. Forty-seven (39 per cent) index mothers and 39 (54 per cent) index fathers reported that at least one of their parents had a personal faith. For the controls the proportions were 15 (29 per cent) mothers and 6 (30 per cent) fathers but when compared with the index group these also were not significantly different.

*Accommodation*

The various types of accommodation occupied by index and control families are shown in Table VI. Most index families were living in houses, maisonnettes, or flats in small blocks.

TABLE V  
*Characteristics of West Indian group. Index cases only*

|                                        | West Indian |      | White |      | Significance<br>(d.f. = 1) |        |
|----------------------------------------|-------------|------|-------|------|----------------------------|--------|
|                                        | No.         | (%)  | No.   | (%)  | $\chi^2$                   | P      |
| Biological father absent .. ..         | 17/19       | (90) | 26/94 | (28) | 23.06                      | < .001 |
| Rare contact with parents .. ..        | 13/19       | (68) | 35/93 | (38) | 4.91                       | < .05  |
| Frequent use of physical punishment .. | 14/19       | (74) | 42/88 | (48) | 3.24                       | N.S.   |

TABLE VI  
*Types of accommodation occupied by index and control families*

|            | House |      | Maisonnette<br>or flat in<br>small block |      | Flat in<br>tall block |      | Sharing<br>house |      | Other* |      | Total |
|------------|-------|------|------------------------------------------|------|-----------------------|------|------------------|------|--------|------|-------|
|            | No.   | (%)  | No.                                      | (%)  | No.                   | (%)  | No.              | (%)  | No.    | (%)  |       |
| Index ..   | 46    | (37) | 24                                       | (19) | 8                     | (6)  | 18               | (14) | 29     | (23) | 125   |
| Control .. | 24    | (46) | 9                                        | (17) | 6                     | (12) | 7                | (14) | 6      | (12) | 52    |

\* Other includes room in multi-occupied house, lodgings or 'halfway house'.

Only 8 index (6 per cent) and 6 control families (12 per cent) were living in tower block flats. Forty-three index (37 per cent), compared with 13 (25 per cent) of the control homes, were rated as being dilapidated (difference not significant). However, 54 index (43 per cent) compared with 8 controls (15 per cent) had homes lacking in one or more essential amenities ( $\chi^2 = 11.29$ ; d.f. = 1;  $p < .001$ ), and class control did not affect this result. Twenty-five index (28 per cent) compared with 3 control homes (6 per cent) were rated as dirty and untidy ( $\chi^2 = 8.22$ ; d.f. = 1;  $p < .01$ ). Seventy-three index (60 per cent), compared with 16 control parents (31 per cent), had moved house on more than two occasions in the three year period prior to interview ( $\chi^2 = 7.0$ ; d.f. = 1;  $p < .01$ ). One hundred and six index (87 per cent), compared with 32 control children (63 per cent), shared a bedroom with another member of the family ( $\chi^2 = 11.53$ ; d.f. = 1;  $p < .01$ ). Eighty-seven index (71 per cent) compared with 22 control homes (43 per cent) had cramped sleeping accommodation ( $\chi^2 = 11.07$ ; d.f. = 1;  $p < .001$ ). All these findings, except child's possession of his own room, became insignificant when class was held constant.

#### *Social isolation*

A sizeable proportion of index mothers reported having infrequent or no contact with their parents, relatives, neighbours or friends (Table VII). Fifty-three (54 per cent) as compared with 16 control mothers (31 per cent) described themselves as lonely ( $\chi^2 = 6.80$ ; d.f. = 1;  $p < .01$ ). Thirty-nine index (32 per cent) compared with 5 (10 per cent) control

mothers, had no social activities ( $\chi^2 = 8.65$ ; d.f. = 1;  $p < .01$ ). Fifty-seven index (49 per cent), compared with 13 controls (26 per cent), reported that they had no opportunities of having a break from the child ( $\chi^2 = 7.19$ ; d.f. = 1;  $p < .01$ ). When the social class distribution of the two samples was held constant, loneliness and contact with neighbours and friends became insignificant, but on other measures the contrast remained. Boredom was reported by slightly though not significantly more control than index mothers, 29 (57 per cent) as against 51 (44 per cent).

Only 3 index (4 per cent) and 2 control fathers (10 per cent) reported having no social activities. This contrasts sharply with the marked difference between index and control mothers ( $\chi^2 = 8.19$ ; d.f. = 1;  $p < .01$ ). The difference between index mothers and index fathers is also highly significant ( $\chi^2 = 18.22$ ; d.f. = 1;  $p < .001$ ) in this same respect.

Of those index mothers who rarely saw their parents, 25 (81 per cent) said they had an unhappy childhood, as compared with 15 (52 per cent) of those who saw their parents frequently ( $\chi^2 = 4.42$ ; d.f. = 1;  $p < .05$ ).

#### *Income*

The average weekly income of index fathers was £21.50 with a range of £8-40 and a median bracket of £21 to £25. For the controls the mean was £31. Forty-nine index fathers (71 per cent) compared with 9 controls (41 per cent) earned less than £25 per week ( $\chi^2 = 5.29$ ; d.f. = 1;  $p < .05$ ). Twenty-two index fathers (31 per cent) regarded their income as 'inadequate', but the difference was not significant when compared with 7 controls (35 per cent).

TABLE VII  
*Indices of social isolation among index and control mothers*

|                                    | Index  |      | Control |      | Significance<br>(d.f. = 1) |        |
|------------------------------------|--------|------|---------|------|----------------------------|--------|
|                                    | No.    | (%)  | No.     | (%)  | $\chi^2$                   | p      |
| Rare contact with parents .. ..    | 57/122 | (47) | 12/52   | (23) | 7.56                       | < .01  |
| Rare contact with relatives .. ..  | 60/122 | (49) | 9/52    | (17) | 14.17                      | < .001 |
| Rare contact with neighbours .. .. | 62/121 | (51) | 17/52   | (33) | 4.32                       | < .05  |
| Rare contact with friends .. ..    | 68/122 | (56) | 15/52   | (29) | 9.52                       | < .01  |

Index fathers were mainly manual workers, whereas control fathers were normally distributed among the different occupational levels (61). In 1972 the average weekly earnings for manual workers (aged 21-65) for Great Britain was £30.90 and for all workers it was £37 (62). Though both index and control fathers earned less than the national average, this is a reflection of their lower age group (17-46 years). However, when their mean earnings are related to their respective national class populations, the disparity is only £3.40 greater for control than for index fathers. Furthermore, when social class is held constant there is no longer a significant contrast between the two groups.

#### *Mothers' assessment of allowance and food expenditure*

Forty-four index (26 per cent), compared with 9 control mothers (18 per cent), regarded their housekeeping allowance as inadequate ( $\chi^2 = 5.05$ ; d.f. = 1;  $p < .05$ ). Sixty index (54 per cent) spent less than £2 per head on food per week, compared with 14 control mothers (28 per cent). This difference was significant ( $\chi^2 = 8.92$ ; d.f. = 1;  $p < .01$ ), but not after social class had been taken into account.

#### *Unemployment and stability of employment*

Fifteen of the index fathers (14 per cent) were unemployed at the time of the battering incident. Seven of the control fathers (13 per cent) were unemployed (difference was not significant). Slightly more, though not significantly more, index than control fathers had changed their jobs on more than five occasions, 55 (64 per cent) as against 10 (42 per cent).

#### *Dissatisfaction*

Thirty-two index (26 per cent), compared with 2 control mothers (4 per cent), reported that they were generally dissatisfied with their total situation ( $\chi^2 = 10.24$ ; d.f. = 1;  $p < .01$ ), and this result held with social class control. Thirteen (20 per cent) index compared with none of the control fathers described themselves as being generally dissatisfied.

#### *Worries*

Ninety-three index (74 per cent), compared with 25 control mothers (48 per cent), reported

that they had two or more significant worries ( $\chi^2 = 7.79$ ; d.f. = 1;  $p < .01$ ). The most frequent worries described were health of others 70 (56 per cent), money 70 (56 per cent), housing 62 (49 per cent), domestic friction 34 (27 per cent), unemployment 33 (26 per cent), own health 31 (25 per cent) and marital status 20 (25 per cent). The rank order was the same for the controls, but the proportions having money and housing problems were lower. Domestic friction, marital status and unemployment were seldom mentioned by the control mothers.

Fifty index (70 per cent) and 8 controls (40 per cent) reported two or more significant worries ( $\chi^2 = 5.9$ ; d.f. = 1;  $p < .05$ ). Among the index fathers the worries described were approximately in the same rank order as the index mothers.

The proportion of index parents having worries was no higher than for the control sample when equated for social class.

#### *Characteristics of identified perpetrators*

Table VIII compares the percentages of those cases where a perpetrator was identified with the percentages for the total sample on each variable found to be significant for the index sample. The proportions on almost every variable tended to be a little higher than those reported for the total sample. Some differences between cases with an identified perpetrator and the remainder were significant. These are indicated on the Table.

#### DISCUSSION

All these findings suggest that lack of family cohesiveness is an important factor underlying baby battering. In over one third of cases the biological father was absent from the home, and in half the mothers were living with some other man. These findings closely agree with those of several other authors (19, 23, 58) and are at variance with the view that battering parents have stable personal relationships (64).

Half the mothers in the index sample had married before the age of 20 years, and three-quarters had conceived pre-maritally. Among the population at large such a combination is

particularly likely to be associated with marital breakdown (25, 53). Though fewer index than control parents directly admitted marriage problems, a significant proportion reported disharmony in child-rearing and dissatisfaction with the partner's handling of the child. These characteristics may be taken as indices of disagreement between husband and wife over their

respective roles; such indices are also predictors of divorce (25). Short acquaintance before marriage is another predictor of divorce also found in our sample. Half the mothers were neurotic and two-thirds of the fathers had a personality disorder (61). Neurotic and personality disorders are factors also associated with marital breakdown (4, 33). In contrast, in early

TABLE VIII  
*Characteristics of identified perpetrators compared with total sample*

| Data from index mothers                         | Total sample                      |    | Identified perpetrators     |    | $\chi^2$ * | p*     |
|-------------------------------------------------|-----------------------------------|----|-----------------------------|----|------------|--------|
|                                                 | N                                 | %  | N                           | %  |            |        |
| Marital status .. .. .                          | 36/124                            | 29 | 18/55                       | 33 | N.S.       |        |
| Absent father .. .. .                           | 44/125                            | 35 | 27/55                       | 49 | 7.26       | < .01  |
| Age at 1st child .. .. .                        | (mean = 19.8 years for 131 cases) |    | (mean = 20.0 for 58 cases)  |    | N.S.       |        |
| 6 mths. acq. before marriage .. .. .            | 12/81                             | 15 | 6/36                        | 17 | N.S.       |        |
| Unsatisfactory marriage .. .. .                 | 36/121                            | 30 | 26/53                       | 49 | 15.21      | < .001 |
| Pre-marital conception .. .. .                  | 87/123                            | 71 | 44/55                       | 80 | 3.36       | = .07  |
| Illegitimacy .. .. .                            | 45/125                            | 36 | 24/55                       | 44 | N.S.       |        |
| Reservations about pregnancy .. .. .            | 57/117                            | 49 | 31/55                       | 56 | N.S.       |        |
| Partner had reservations .. .. .                | 44/112                            | 39 | 23/54                       | 43 | N.S.       |        |
| Abortion considered .. .. .                     | 15/121                            | 12 | 7/54                        | 13 | N.S.       |        |
| Low opinion of partner .. .. .                  | 15/118                            | 13 | 13/54                       | 21 | 9.77       | < .01  |
| Partner rejects child .. .. .                   | 17/117                            | 15 | 12/54                       | 22 | 3.70       | = .05  |
| Lack of agreement over child rearing .. .. .    | 47/115                            | 41 | 32/52                       | 62 | 15.25      | < .001 |
| Strained relationships .. .. .                  | 79/110                            | 72 | 43/54                       | 80 | N.S.       |        |
| Mother head of house .. .. .                    | 21/117                            | 15 | 16/54                       | 30 | 7.88       | < .01  |
| Non-white case .. .. .                          | 32/134                            | 24 | 9/55                        | 30 | N.S.       |        |
| Lack of amenities .. .. .                       | 54/125                            | 43 | 23/55                       | 42 | N.S.       |        |
| House dirty and untidy .. .. .                  | 25/90                             | 28 | 12/34                       | 35 | N.S.       |        |
| Two plus moves in 3 years .. .. .               | (mean = 2.0 for 122 cases)        |    | (mean = 2.3 for 55 cases)   |    | (t = 2.66) | < .01  |
| Cramped sleeping .. .. .                        | 87/122                            | 71 | 35/55                       | 64 | N.S.       |        |
| Rare contact with parents .. .. .               | 57/122                            | 47 | 27/55                       | 49 | N.S.       |        |
| Rare contact with relatives .. .. .             | 60/122                            | 49 | 27/55                       | 49 | N.S.       |        |
| Rare contact with neighbours .. .. .            | 62/121                            | 51 | 31/54                       | 57 | N.S.       |        |
| Rare contact with friends .. .. .               | 68/122                            | 56 | 33/55                       | 60 | N.S.       |        |
| Loneliness .. .. .                              | 63/117                            | 54 | 15/55                       | 27 | 13.49      | < .001 |
| Father's income .. .. .                         | (mean = £21.5 for 69 cases)       |    | (mean = £21.9 for 26 cases) |    | N.S.       |        |
| Housekeeping allowance inadequate .. .. .       | 44/121                            | 36 | 29/55                       | 53 | 10.41      | < .01  |
| Dissatisfaction with situation .. .. .          | 32/122                            | 26 | 26/55                       | 47 | 20.98      | < .001 |
| Father dissatisfied with his situation† .. .. . | 13/64                             | 20 | 8/24                        | 33 | N.S.       |        |
| Worries .. .. .                                 | 109/123                           | 87 | 53/55                       | 96 | 4.61       | < .05  |
| Father has worries† .. .. .                     | 61/70                             | 87 | 23/24                       | 96 | N.S.       |        |

\* These values are for the comparison between cases for whom a parent was identified as a perpetrator and those without such identification.

† Rating by father, not mother.

marriages the kinship support has been shown to be an important contributory force in stabilizing the marriage (15). However, the parents in our sample had little contact with their own parents and other relatives. Considering, therefore, that a significant proportion suffered all these marital adversities and that one-third of battered babies were already living with one natural parent only, it may be predicted that a substantial number will eventually grow up in broken homes.

Broken homes, unhappy homes and one-parent families are associated with delinquency (22, 24), deviant behaviour (52), and social and educational deprivation (10) respectively. Our sample has a very large share of such predictors of maldevelopment in the child. Fatal battering has been shown to occur where young, unstable, deserted and unhappy women associate with young, psychopathic and criminal men (57). Such parents were over-represented in our sample (61), suggesting that battered children are at risk not only of social maldevelopment but also of fatal injury.

A high proportion of index mothers conceived premaritally, and more than one third of battered children were illegitimate. This finding is in close agreement with that of other investigations both in the United States (1, 37, 58) and in the United Kingdom (21, 34). Our findings are also particularly striking in the light of those studies (10, 68) which showed that premarital pregnancy and illegitimacy are not directly related to social class. This was also borne out by our observation that equating index and control samples for class did not reduce the contrast between them. Among the population at large the highest proportion of premaritally conceived and illegitimate births is found between 15-19 years and then decreases with maternal age (10, 49). Our mothers, however, differed in this respect, the highest proportions of such births occurring in those between 25-34 years. Furthermore, in all age groups studied our mothers have strikingly more premarital pregnancies and illegitimate births than occur in the general population (49). The highest proportion of all were aged 20-24 years (61), the rate of occurrence of premarital pregnancy and illegitimacy among them being

two and three times respectively higher than the general population rates. Our findings, therefore, strongly suggest that premarital conception and illegitimacy are important precursors of baby battering. It is disconcerting also to observe that illegitimacy was present in 60 per cent of Weston's fatal battered baby cases (70), and that the inconvenience of an unwanted illegitimate child was the most common motive responsible for child murder (50).

Though displeasure at pregnancy was reported by one fifth of index mothers, they were not atypical of their social class in this respect. A smaller but nevertheless significant proportion described their partners as currently rejecting of the child, and this was not class linked. Several authors (18, 34, 40, 66) have postulated an association between unwanted conception and baby battering but there have been no previous controlled investigations of this suggestion. Attempts to do so may, therefore, appear to document the obvious. Nevertheless, research into feelings of unwantedness is fraught with difficulties (46). It may be argued that parents who have confessed to battering a child will rationalize their behaviour by recalling that conception was unwanted. In the index sample those parents who confessed to battering reported as much displeasure at the pregnancy as those parents who denied it.

A degree of ambivalence about pregnancy is common in the population at large (12) and was also observed in our control sample. Harsh childhood experiences have been assumed to be responsible for lack of maternal feelings among baby batterers (64). Our findings suggest that while failure to adjust to the parental role also occurs among the population at large (29) it happens more frequently among baby batterers and can be more simply understood in the context of premarital conception, illegitimacy and marital disharmony rather than by linking it directly to harsh childhood experiences.

A high proportion of out-of-wedlock pregnancies are unwanted (28, 42, 46). Kempe and Helfer (32) have asserted that the most effective way to prevent battering of children is to prevent unwanted births. Several authors (5, 6, 23) have suggested that pre-natal training for mother-

hood, ready availability of contraceptives, abortion on demand and encouragement of sterilization after the birth of the third child can be important factors in the prevention of child abuse. However, there have been no controlled studies demonstrating that early and complete sex education, including contraceptive information, has led to any decline in unwanted conceptions (27). Indeed, in Sweden the illegitimacy rates actually increased following the introduction of such a programme. The evidence also suggests that knowledge about the availability of contraceptives also offers no ready solution (27), for in fact the recent increases in illegitimacy rates in England, the United States and Jamaica have occurred despite such increasing knowledge and availability.

The proportion of illegitimate births rose sharply over the 1950's and 1960's (69), and the younger the mother's age group the greater the rise in proportion (51). Child abuse is associated with both illegitimacy and prematurity of parenthood (61), and these findings cannot be accounted for by social class. Although it cannot be proved that child abuse has increased over the last two decades, its clear association with both illegitimacy and teen-age parenthood suggest that a real increase in child abuse may have occurred. The simplest explanation of the rise in illegitimacy rates, especially among teen-agers, is that society's changing attitude had encouraged extra-marital sexual activity. An effective reversal, therefore, of those attitudes to sex and family which are responsible for increasing rates of illegitimacy might possibly lead to a decline in the numbers of battered babies.

Although society may facilitate or impede the availability of abortion of unwanted conceptions, the evidence suggests (13, 28) that abortion will only produce a reduction in unwanted births if the motivation for limiting family size already exists. The same argument holds for sterilization (46). Our findings that a significant proportion of battering parents expressed a negative attitude towards contraception, and that only 12 per cent of mothers might have even considered an abortion during the study child pregnancy, suggest that the preventative

methods outlined by Gil (23) and Caffey (5), admirable though some of them may be, will have very little impact in preventing baby battering. Indeed, considering that quite as many of the index as of the control parents were in fact using some form of contraceptive, it is perhaps somewhat unrealistic to expect battering parents to become enthusiastic about birth control. Our pessimistic view that such parents are ineffective in and distrustful of birth control is shared by Oliver and Taylor (41) and is also supported by our own findings that the battering sample, unlike the controls, were well on the way to perpetuating the large size of their family of origin.

Among our sample, one third of the battered babies were first-born and only children, and two thirds were second and subsequent born children. Lukianowicz (34) and others (1, 23) have suggested that it is usually the only or youngest child in a family who is battered. Our index sample bears out this trend. This, however, may be reconciled with the general tendency for infants to be admitted to hospital more frequently than older children (11). Indeed, when birth order is properly related to family size the suggestion that a child's particular ordinal position carries more risk of battering does not hold. Furthermore the finding, reported elsewhere (61), that 19 per cent of the child's siblings had also been battered are at variance with Zalba's assertion (73) and Merrill's result (37) that only one particular child in a family is abused.

Several American authors (9, 54, 72) have regarded sub-standard living accommodation as a particularly important stress that contributes to baby battering. Cherry and Kuby (9) vividly describe their apartments 'as drab, dark and frequently foul-smelling', and most of Young's (72) families were living in cold vermin-infested and overcrowded rooms that lacked modern conveniences. In the United Kingdom several authors (21, 57, 59) have also mentioned that accommodation problems are important stress factors operating within these families. In our sample dilapidation was not a significant feature. Dirty and untidy homes and cramped sleeping accommodation were more common than in the control group, but



when adjustments were made for social class the contrast was no longer significant. Lack of one or more essential amenities and possession by a child of its own room were, however, still significant findings when the comparison was class-comparable. Nevertheless, our families are not the most handicapped even in this respect, for in a sample of 'inadequate' families (45) who had not battered their children 96 per cent lacked one or more basic amenities; a considerably higher proportion than in our sample. Our results should therefore caution against the optimistic belief (23), that re-housing will reduce the prevalence of baby battering, since, on the whole, families in our sample were no worse off than others of low social class. This argument is also supported by the observation (21, 59) that re-housing, although providing temporary relief from external pressures, may actually precipitate battering incidents. Our findings suggest, therefore, that personality disorders frequently observed among such parents (57, 61) are more important than environmental factors in contributing to child abuse.

Our findings support those of others who have suggested that baby battering is not related to any particular religious affiliation (3, 34). No support, however, was found for Steele's statement (64) that proportionately more baby batterers belong to strong, rigid, authoritarian and 'fundamentalist' types of religions. Indeed most of our parents were of nominal religion only. However, although both they and a similar proportion of control parents lacked a personal faith it was nevertheless interesting to observe that proportionately fewer battering parents retained the personal faith of their parents. In the context of hypotheses about a battering parent's own deprived childhood experiences, lack of a persisting religious influence may be a factor worthy of further exploration.

One fifth of the battered children were non-White, compared with 15 per cent non-White children aged 5 years and under in the Birmingham population at large (8). Owing to communication difficulties our sample did not include all Asian battered babies, and our numbers on this are probably an underestimate. Nevertheless, Schloesser (56) and Kempe (31)

have asserted that baby battering is not related to ethnic or cultural factors, in contrast to several other American studies (17, 58) which have demonstrated that proportionately more battered children are coloured. However, information on the ethnic background of battered children in the United Kingdom has been limited, and for this reason a comparison with the United States may not be valid. Skinner and Castle (59) observed that 6.5 per cent of their sample were West Indian and Asian, while Scott (57) in a study of fatal battered baby cases observed that 10 per cent of the fathers were coloured and a high proportion were Irish, but neither author reported control figures. The slight over-representation of non-White battered children in our sample may reflect a higher morbidity of non-White groups. It may also be a reflection of the particular characteristics of the ethnic group concerned (48). We found no support for Gil's suggestion (23) that the over-representation of non-White children indicates discriminating attitudes and practices on the part of the referring agency. We also found no support for suggestions that Asians and West Indians are younger, have more children and live in poorer conditions than parents of White battered babies.

Battering among West Indians may be a reflection of the higher incidence of broken homes (absence of natural father) and excessive use of physical punishment. Although few Asians had broken homes they more frequently lacked the support of contact with their parents. Thus lack of support was common to both Asian and West Indian groups.

Ebbin (17) has suggested that the type of injury inflicted is not related to ethnic factors. Our findings concur with this statement. Of our battering group 4 mothers were psychotic, 2 being paranoid schizophrenics. Both were West Indians who inflicted bizarre injuries. Although the preference for male children in Moslem cultures is strong (63), we did not find more Moslem girls than boys in our sample.

Financial problems have been regarded as an important precipitant of baby battering (2, 23). However, when compared with samples of similar age and social class the income and expenditure on food of the battering group was

not low. Unemployment was a characteristic of index fathers, but was no less frequent in the controls and does not therefore have the significance attributed to it by others (59). It is thus erroneous to conclude that the provision of economic security to battering families by such mechanisms as 'mother's wages', 'children's allowances', 'negative income tax' (23), and of 'homemaker services' (32), will markedly reduce the prevalence of baby battering. In this and other related fields (67) considerable emphasis has been placed upon the relief of material hardships to the exclusion of less easily eradicated handicaps. The Children and Young Persons Act (7) makes provision for 'giving assistance in kind or in exceptional circumstances in cash' to deserving families. However, even when aid is granted from public assistance agencies it does not prevent baby battering, for in Gil's series (23) nearly two-thirds of the parents had received financial assistance during or prior to the year of the battering incident. It is our contention, therefore, that constitutional personality differences are more fundamental than financial factors in the causation of baby battering.

Though loneliness was reported by many index mothers, it was also reported by many controls, especially in the low social classes. More than half the index mothers lacked social contacts with neighbours and friends. Among the population at large this is also a feature that characterizes working class families, who, in contrast to middle class families, compensate for this deficiency by maintaining contact with their parents and other relatives (71). However, a significant proportion of our sample did not compensate in this respect and were devoid of all forms of social contact. Although social isolation may be dependent upon geographical mobility (55), a more significant association occurred in our sample between lack of social contact with parents and an unhappy childhood, and this may also be a reflection of the poor relationship such mothers had with their own parents. Unlike other socially isolated populations (55), our index parents did not avail themselves of social support at crises times even though two-thirds had previous contact with social agencies. Social isolation and a

reluctance to avail themselves of social support has also been observed in other battered baby studies (14, 40, 72). Nurse (40) has asserted that because battering parents do not turn to society for help society must seek out and help battering parents. This would seem to be true, but it is unrealistic to expect such parents to take the initiative and avail themselves of 24-hour lifeline services (32) operating on the lines of the Samaritans (65).

Working class populations have fewer social activities (26, 38, 71). The proportion of our mothers who were devoid of social activity is even higher than expected for their social class, and this concurs with the findings of those authors (14, 40) who have maintained that community contacts of battering parents are minimal. However, the contrast between mothers and their spouses in this respect is striking, for only 3 fathers did not manage to occupy their leisure time. Considering that nearly half the mothers lacked baby-sitting arrangements and that this result was not affected by controlling for class, it could be argued that this was the prime reason for their failure to occupy themselves socially in the community. It is more probable, however, that this failure to participate in recreational activities is a reflection of the incompatibility between parents themselves. This in itself may be partially explained by the high frequency of psychopathy in the fathers and neuroticism and subnormality in the mothers (61). In the course of our research we have found a semantic differential technique (43) to be a useful means of communicating with battering parents. Psychotherapy which concentrates on the parents' perception of themselves in relation to others, taking into account their low intelligence, should be explored further as a method of relieving the mother's loneliness and possibly preventing baby battering.

Our results also showed that when only those cases for whom a perpetrator had been identified were considered, all the characteristics described above, with the exception of loneliness, applied to at least the same proportion. Marital disharmony emerged as particularly characteristic of the known perpetrators and this finding merits further exploration.

## CONCLUSION

Our results show that when a variety of social and economic factors are carefully examined baby batterers are observed to be far less handicapped than previous studies have indicated. Furthermore, when placed alongside the high incidence of personality disorders, anomalies of status and youthfulness of the parents, socio-economic support to such families will only be meaningful if included in a programme of adaptation to such handicaps.

The similarities between baby battering and other forms of deviant behaviour are striking. Like delinquency and crime in general, baby battering occurs alongside a constellation of other social inadequacies or failure of adaptation rather than in isolation. Such consideration might save some disappointment and wasted effort. Innumerable studies of deviant behaviour have been remarkably unrewarding in establishing either causes or treatment. Battering parents must first be properly classified and the natural history of the condition closely observed before we can be confident about treatment measures other than emergency action. Indeed, no study has convincingly shown that any treatment of battering parents is effective.

We have previously cautioned against supporting the parents to the detriment of the safety of the child (60). In the light of our findings we would agree with Polansky's (47) view that this is 'an area in which social, medical and legal action must be authoritative, intrusive and insistent'. As with crime and delinquency, treatment is only likely to be a supporting exercise. True prevention must lie in the effective education of the next generation and in changes in child care legislation.

## SUMMARY

A controlled investigation of 214 parents of battered babies shows that pre-marital pregnancy and illegitimacy, absence of the child's father, marital disharmony and rejecting attitude towards the child are precursors of baby battering. Battered babies are likely to be reared in broken homes and are at risk of social maldevelopment and death. Ineffectiveness and distrust of contraception by these parents

suggests that various birth control measures are unlikely to be effective in reducing the prevalence of battered babies.

Battering parents compare reasonably with other low social class groups, in their standards of income, and weekly food expenditure. Housing is in some respects worse. Improvement in material benefits without regard to the parents' personality deficiencies is therefore unlikely to affect the increase in the number of battered babies. Social isolation is a characteristic of these parents and reflects their unhappy childhood. Lack of kinship support was particularly important among the non-White parents. Treatment can be supportive only, and true prevention must lie in effective education of the next generation and in possible changes in the law relating to child care.

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## APPENDIX

| Questions and response categories                                                                                          | Category combinations for $\chi^2$ test | Questions and response categories                                                                                                   | Category combinations for $\chi^2$ test              |
|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| Social class was based on the Registrar General's Classification of Occupations, 1966.                                     |                                         | * <i>Contraception</i>                                                                                                              |                                                      |
| * Pre-marital pregnancy was questioned and checked on the basis of dates of marriage and birth of first child.             |                                         | 'Do you want any more children? Are you doing anything about contraception?'                                                        |                                                      |
|                                                                                                                            |                                         | No/Yes.                                                                                                                             |                                                      |
| <i>Attitude to pregnancy</i>                                                                                               |                                         | <i>Husband's reaction to relevant pregnancy</i>                                                                                     |                                                      |
| 'Did you feel when you were expecting . . . that it was a good time to have a baby? Or would it have been better to wait?' | a and b vs. c<br>also a vs. b and c     | 'How did your husband feel about your pregnancy with . . .?' or if not the biological father 'How did your husband take to . . .?'  | a vs. b and c<br>(=ambivalent)<br>also b and b vs. c |
| (a) delighted; (b) pleased on the whole, some reservations; (c) displeased.                                                |                                         | (a) delighted; (b) pleased on the whole; (c) generally displeased.                                                                  |                                                      |
|                                                                                                                            |                                         | <i>Evaluation of partner</i>                                                                                                        |                                                      |
| * <i>Abortion</i>                                                                                                          |                                         | 'How much alike do you think you and your husband are? Would you rather have . . . to grow up to be like you or like your husband?' | a and b vs. c                                        |
| 'Would you have liked an abortion when pregnant with . . .?'                                                               |                                         | (a) thinks highly of; (b) appreciates on the whole, dislikes some things; (c) thinks poorly of.                                     |                                                      |
| No/Yes.                                                                                                                    |                                         |                                                                                                                                     |                                                      |

|                                                                                                                                       |                                                                                                   |                                                                                                                                                                                             |                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <i>Partner's relationship with child</i>                                                                                              |                                                                                                   | <i>M.S.W.'s assessment of housing</i>                                                                                                                                                       |                                                                                                      |
| 'Will you tell me how . . . 's father gets on with him? Does he like to help with him?'                                               | a and b vs. c                                                                                     | (a) good; (b) reasonable condition; (c) dilapidated                                                                                                                                         | a and b vs. c                                                                                        |
| (a) very fond of child, enjoys playing, etc.; (b) quite fond of child, takes interest; (c) rejects or is not interested in the child. |                                                                                                   | <i>M.S.W.'s assessment of care of home</i>                                                                                                                                                  |                                                                                                      |
|                                                                                                                                       |                                                                                                   | (a) obsessively clean and tidy; (b) reasonable; (c) dirty and untidy                                                                                                                        | a and b vs. c                                                                                        |
| <i>Agreement on child rearing practices</i>                                                                                           |                                                                                                   | <i>Contact with (i) parents; (ii) other relatives; (iii) neighbours; (iv) friends.</i>                                                                                                      |                                                                                                      |
| 'In general, how well would you say you and your husband agree about the best way to handle . . . ?'                                  | a vs. b and c<br>also a and b vs. c                                                               | (a) almost daily; (b) approx. weekly; (c) monthly; (d) infrequently; (e) never.                                                                                                             | a, b and c vs. d<br>and e                                                                            |
| (a) discuss and/or usually agree; (b) disagree frequently; (c) partner doesn't participate.                                           |                                                                                                   | <i>Regular social activities</i>                                                                                                                                                            |                                                                                                      |
|                                                                                                                                       |                                                                                                   | (a) sports; (b) other clubs; (c) evening classes; (d) public house; (e) church; (f) visiting friends; (g) others.                                                                           | any vs. none                                                                                         |
| <i>Head of household</i>                                                                                                              |                                                                                                   | <i>Opportunity for breaks from care of child</i>                                                                                                                                            |                                                                                                      |
| 'Who makes the important decisions for the family?'                                                                                   | a and b vs. c                                                                                     | 'Can . . . play (or be in pram) out of doors without you being with him all the time? Can baby sitting be arranged?'                                                                        | Yes to one or both vs. no to both and including cases where baby sitting 'available' but not desired |
| (a) father; (b) share; (c) mother.                                                                                                    |                                                                                                   |                                                                                                                                                                                             |                                                                                                      |
| <i>Personal significance of religion</i>                                                                                              |                                                                                                   | <i>Assessment of allowance</i>                                                                                                                                                              |                                                                                                      |
| 'Does religion mean anything to you?'                                                                                                 | a and b vs. c                                                                                     | (a) generous; (b) adequate; (c) inadequate.                                                                                                                                                 | a and b vs. c                                                                                        |
| (a) nothing; (b) goes to or nominally attached to place of worship; (c) personal faith.                                               |                                                                                                   | <i>Any significant worries</i>                                                                                                                                                              |                                                                                                      |
|                                                                                                                                       |                                                                                                   | 'Are any of the following worries for you?' (a) money; (b) domestic friction; (c) own health; (d) health of others; (e) housing; (f) employment; (g) marital status; (h) moral or personal. | non or one vs. two or more                                                                           |
| <i>Religious background</i>                                                                                                           |                                                                                                   | <i>Reaction to total situation</i>                                                                                                                                                          |                                                                                                      |
| (a) none; (b) one or both parents nominally religious; (c) one or both parents had personal faith.                                    | a vs. b and c                                                                                     | 'How satisfied are you with your present life?' (a) very; (b) fairly; (c) not at all.                                                                                                       | a vs. b and c                                                                                        |
| <i>Amenities</i>                                                                                                                      |                                                                                                   | Items marked * are from psychiatric interview.                                                                                                                                              |                                                                                                      |
| (a) fixed bath (own or shared); (b) running water inside own accommodation; (c) W.C. indoors; (d) own kitchen.                        | all present vs. 1 or more missing                                                                 |                                                                                                                                                                                             |                                                                                                      |
| <i>Child's sleeping arrangements</i>                                                                                                  |                                                                                                   |                                                                                                                                                                                             |                                                                                                      |
| (a) own room; (b) shares room with sibs; (c) shares bed with sibs; (d) shares room with parents; (e) shares bed with parents.         | a vs. others for 'lacks own room'<br>also a and b vs. others for 'cramped sleeping accommodation' |                                                                                                                                                                                             |                                                                                                      |

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## Clinical and EEG Studies of Prisoners Charged with Murder

By M. V. DRIVER, L. R. WEST and M. FAULK

For some years EEG recordings have been carried out at the Maudsley Hospital on male persons charged with murder and in custody while awaiting trial. These recordings have been undertaken at the request of the prison authorities with the consent of the defence and irrespective of whether or not there was a recognized clinical indication for such a procedure. During the period 1964 to 1969 150 such prisoners were examined, only 97 of whom were subsequently brought to trial on a charge of murder, with the outcome as given in Table I. Towards the end

TABLE I  
*Outcome of trials for murder*

|                                          |    |
|------------------------------------------|----|
| Acquitted .. .. .                        | 11 |
| Guilty of murder .. .. .                 | 25 |
| Guilty of manslaughter .. .. .           | 41 |
| GUILTING of manslaughter, section 2      | 9  |
| Not guilty by reason of insanity .. .. . | 0  |
| Not fit to plead .. .. .                 | 2  |
| Automatism .. .. .                       | 0  |
| Self defence .. .. .                     | 2  |
| Others .. .. .                           | 7  |
| Total 97                                 |    |

of this period EEGs were recorded from 20 volunteer male members of the hospital staff, all within the same age range as the prisoners (mean age 30 years, range 16-70) and none with any previous history of obvious medical or forensic relevance.

This report describes the findings in the 97 who came to trial on a charge of murder and compares the EEG data in this group with those of the 53 who ultimately came to trial on lesser charges and the 20 normal subjects. It also reviews previously published work related to the EEG in persons charged with or convicted of murder and comments on the place of EEG investigation in pre-trial assessment.

### METHOD OF INVESTIGATION

Clinical assessment of the prisoners, which was based in every instance on the results of a routine physical examination and examination of the mental state, together with full personal and family histories, was made exclusively by one of the authors (M.F.) who had no knowledge of the EEG findings.

Following the report of Stafford-Clark and Taylor (1949) the prisoners who came to trial on the charge of murder were grouped into the following categories:

*Group I:* in which the killing had been incidental to the commission of another crime or had been in self defence. Cases in which harm had been intentional, e.g. a blow on the head during a robbery, were not included.

*Group II:* in which it was considered that there was a clear motive for killing or in which death followed intended violence during the commission of another crime.

*Group III:* in which the crimes were apparently motiveless or in which the motive was very slight.

*Group IV:* persons charged with murder in which sexual activities of some kind had occurred actually at the time of the offence.

*Group V:* persons found unfit to plead or 'guilty but insane' (now 'not guilty by reason of insanity') at trial, together with those who were subsequently found to be insane at Statutory Enquiry.

The EEG records were made according to the standard bipolar procedure of the Maudsley Hospital, which for present purposes can be considered as differing in no essential way from the international 10-20 system.

There was in each case a recording time of approximately 30 minutes, followed by 3 minutes of voluntary hyperventilation and a similar period of intermittent photic stimulation at various frequencies (approximately 1-40 flashes per second). In a few instances further recordings were taken during sleep to clarify or accentuate abnormalities found in the initial EEG; the findings of these recordings are not included in this report.

The EEG recordings of the 170 subjects were analysed visually by one of the authors (L.R.W.) who had no knowledge at the time of the purpose of the



investigation, the source of the subjects or their circumstances (e.g. 'prisoner' or 'control') or name, age, sex etc., nor of the contents of the report sent at the time of the actual recording procedure to the prison authorities. The results of the visual analysis, age now being allowed for, were then classified by L.R.W. and M.V.D. into four categories without knowledge of which EEG related to which subject, using the same criteria as Stafford-Clark and Taylor (1949) viz.

- (i) Normal.
- (ii) Mild unspecific abnormal: showing excess for the age of fronto-temporal theta rhythm or of 4-7 c/s rhythm posteriorly.
- (iii) Severe unspecific abnormal: showing a dominant post central (alpha) rhythm at less than 8 c/s or symmetrical high voltage paroxysmal rhythms in any region at frequencies outside the normal alpha range.
- (iv) Specific focal or epileptic abnormalities: showing gross asymmetries or any of the various irregular or spike wave forms such as are commonly found in epilepsy or localized organic brain disease.

## RESULTS

The clinical assessment of the 97 persons who come to trial charged with murder gave the following breakdown, Stafford-Clark and Taylor's (1949) breakdown calculated for an equivalent total being given in parentheses:

|           |    |      |
|-----------|----|------|
| Group I   | 2  | (17) |
| Group II  | 57 | (24) |
| Group III | 23 | (23) |
| Group IV  | 5  | (12) |
| Group V   | 10 | (21) |
|           | 97 | (97) |

The results of the EEG assessment in each of the five groups is given in Table II. Of the total of 97, 9, i.e. 9 per cent, were found to have some EEG abnormality, in most cases of a severe rather than a mild nature. Further details of these 9 cases are given in Table III. Table II also lists the EEG findings in the remaining 53 prisoners, who were ultimately

TABLE II  
EEG findings in all categories of subject

| EEG classification            | On trial for murder |    |     |    |    | Total | Tried on<br>lesser<br>offence | Control<br>subjects |
|-------------------------------|---------------------|----|-----|----|----|-------|-------------------------------|---------------------|
|                               | Group               |    |     |    |    |       |                               |                     |
|                               | I                   | II | III | IV | V  |       | Total                         | Total               |
| Normal . . . . .              | 2                   | 52 | 22  | 4  | 8  | 88    | 47                            | 18                  |
| Mild unspecific . . . . .     | 0                   | 1  | 0   | 0  | 0  | 1     | 0                             | 0                   |
| Severe unspecific . . . . .   | 0                   | 2  | 1   | 0  | 0  | 3     | 1                             | 0                   |
| Focal or epileptic . . . . .  | 0                   | 2  | 0   | 1  | 2  | 5     | 5                             | 2                   |
| Total subjects . . . . .      | 2                   | 57 | 23  | 5  | 10 | 97    | 53                            | 20                  |
| Total abnormalities . . . . . | 0                   | 5  | 1   | 1  | 2  | 9     | 6                             | 2                   |
| % abnormalities . . . . .     |                     |    |     |    |    | 9     | 11                            | 10                  |

TABLE III  
Murder cases with abnormal EEGs

| Age | Group | EEG abnormality    | Psychiatric classification | Outcome of trial |
|-----|-------|--------------------|----------------------------|------------------|
| 16  | II    | Focal or epileptic | Normal                     | Manslaughter     |
| 17  | II    | Severe unspecific  | Normal                     | Guilty of affray |
| 20  | II    | Focal or epileptic | Personality disorder       | Acquitted        |
| 21  | II    | Mild unspecific    | Personality disorder       | Manslaughter     |
| 25  | II    | Severe unspecific  | Personality disorder       | Manslaughter     |
| 25  | III   | Severe unspecific  | Personality disorder       | Acquitted        |
| 30  | IV    | Focal or epileptic | Personality disorder       | Guilty of murder |
| 27  | V     | Focal or epileptic | Schizophrenia              | Not fit to plead |
| 29  | V     | Focal or epileptic | Schizophrenia              | Not fit to plead |

tried for offences less serious than murder, and also in the 20 control subjects. All three classes of subject, i.e. those tried for murder, those tried for other offences, and the controls, showed an approximately 10 per cent incidence of EEG abnormality, and in particular of the focal or epileptic variety which predominated. Table IV gives the incidence of psychiatric disorder and EEG abnormality in the two largest categories according to outcome, i.e. guilty of murder and guilty of manslaughter, accounting for two thirds of those coming to trial. The incidence of psychiatric disorder in the two categories taken together is high (40 per cent), while that of EEG abnormality is low (6 per cent) and not significantly different from that in the remaining categories listed in Table I.

#### DISCUSSION

Although several studies of EEG findings in murderers have been published (Stafford-Clark and Taylor, 1949; Hill and Pond, 1952; Winkler and Kove, 1962; Sayed, Lewis and Brittain, 1969) it is difficult to draw any definite conclusions regarding the question whether or not electroencephalography is a useful routine procedure in the pre-trial assessment of those charged with murder. Hill (1963), in his review of work published up to 1955, stated that there could be little doubt that murderers as a group were severely abnormal from a psychiatric point of view, and that the incidence of abnormality in the EEG of such subjects was probably much the same as that found in admissions to the acute wards of a mental hospital (about 50 per cent). Winkler and Kove (1962) reported that of 55 subjects charged with murder or manslaughter 13 (24 per cent) had abnormalities in the EEG. All these subjects were at the time of the investigation under observation in the psychiatric prison ward of a hospital, but it is not clear whether they were selected from a larger group. Nine of the 13 subjects with EEGs reported as abnormal had epilepsy, symptoms of organic brain disease or a history of head injury. There was no information regarding the neurological or psychiatric status of the 42 subjects found to have normal EEGs. The authors concluded that it was imperative to apply the EEG as a routine measure to all

patients sent for psychiatric examination after being charged with homicide.

The report by Sayed, Lewis and Brittain (1969) relates only to insane murderers. Of the 32 such subjects examined, 21 (66 per cent) were classed as having some EEG abnormality. Just under half of these latter had a 'diffuse abnormality' corresponding approximately to the 'mild unspecific abnormality' of Stafford-Clark and Taylor (1949) and the present authors. A control group from the staff of the hospital showed about 16 per cent abnormal EEGs, just over half of which were in the 'diffuse abnormality' group. The authors concluded that the EEG could be used as supportive evidence for the existence of brain dysfunction in cases where the McNaughton Rules could be invoked, but that 'in less severely disturbed patients the EEG has much less to contribute in establishing criminal responsibility'.

In the absence of any definite quantitative criteria regarding what constitutes such terms as 'mild unspecific' or 'severe unspecific' abnormal EEGs, no detailed comparison between the findings of Stafford-Clark and Taylor and those presented here can be made. However, it is unlikely that the categories of EEG abnormality described here and by Stafford-Clark and Taylor as 'severe unspecific' and 'specific focal or epileptic' and by Sayed, Lewis and Brittain as 'paroxysmal', 'focal' or 'generalized' would be classified very differently by others. Stafford-Clark and Taylor's findings in these categories amount to 15 out of a total of 64 subjects (23 per cent), whereas those of the series reported here amount to only 8 out of 97 (8 per cent), a difference significant at the 1 per cent level of confidence. This difference is unlikely to be due to different composition in respect of the basic grouping, since Groups II and III were in the majority in both series. Possibly part of the difference relates to differences in the incidence of neurological and psychiatric disorder (for example 15 (23 per cent) of the early series but only 2 (2 per cent) of the present series were judged to be insane), part to the difference in the numbers found guilty of murder as opposed to manslaughter etc. (44, 69 per cent, in the early series; 25, 26 per cent, in the present series), and partly to

TABLE IV

*Incidence of psychiatric disorder and EEG abnormality*

| Status                 | Nil | Schizo-<br>phrenia | Psychopathic<br>personality | Personality<br>disorder | Total | Number<br>with<br>abnormal<br>EEGs |
|------------------------|-----|--------------------|-----------------------------|-------------------------|-------|------------------------------------|
| Guilty of murder ..    | 11  | 1                  | 2                           | 11                      | 25    | 1                                  |
| Guilty of manslaughter | 28  | 1                  | 0                           | 12                      | 41    | 3                                  |
| Total .. ..            | 39  | 2                  | 2                           | 23                      | 66    | 4                                  |

some degree of selection during the early part of Stafford-Clark and Taylor's investigation. The issue is complicated by the observation that a plea of insanity at the time of the latter investigation might nowadays be replaced by a plea of guilty of manslaughter under Section 2 of the Homicide Act. It is also complicated by the fact that Stafford-Clark and Taylor found fewer of the more severely abnormal EEGs in those judged guilty of murder, whether insane or not (20 per cent), than in those acquitted or found guilty of other than murder (28 per cent). Perhaps in some circumstances a reported abnormal EEG had some importance in reduction of the charge from murder to manslaughter.

In the present investigation the total incidence of psychiatric abnormality (Table IV) is high, being 14 of 25 (56 per cent) found guilty of murder and 13 of 41 (32 per cent) found guilty of manslaughter. These figures bear out Hill's (1963) statement that murderers as a group are severely abnormal from the psychiatric point of view. The EEG findings in these subjects (Tables III and IV) do not, however, support his opinion that the incidence of EEG abnormalities is high. Even if 'not fit to plead' is included in the 'guilty' category, only 6 of the total 66 (9 per cent) found guilty of murder or manslaughter had abnormal EEGs, a similar percentage to that found in the normal control subjects and also reported in otherwise normal perpetrators of solitary major crimes of violence (Williams, 1969).

The abolition of the death penalty for murder has probably had both direct and indirect

effects in making the composition of a contemporary group of persons charged with and tried for that offence very different from what would have been the case twenty years ago. The series reported here must be viewed from the standpoint of present-day circumstances and experience in Great Britain, and the conclusion to be drawn is that there is no strong case for routine electroencephalographic examination of all those being assessed prior to trial for murder.

#### SUMMARY

EEG findings are reported in 150 prisoners charged with murder, of whom 97 came to trial on that charge. The incidence of EEG abnormality was approximately equal to that found in a normal control group (10 per cent). Relevant literature is discussed, and the conclusion is drawn that there is no strong case for routine EEG examination of all those being assessed prior to trial for murder.

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## Patterns of Admission in Schizophrenia

By N. A. TODD

Many surveys have been made of the course of schizophrenia, with results which may vary with diagnostic criteria, source and possible selection of patients, hospital admission and discharge policy (and facilities), and many other factors. The time scale is of particular relevance in view of the sometimes life-long course of the condition. Short-term studies thus have limitations to their value, and long-term surveys present problems, such as changes in fashions of diagnosis and management, which may affect their relevance at the time of publication. At present, there is much discussion of the relative roles of general hospital psychiatric units, mental hospitals and community care in the management of schizophrenia, and these organizational aspects are closely bound up and indeed are sometimes confused with the clinical course of the illness.

The present study aims to give an account of first admissions, readmissions and recruits to the long-stay population amongst all male patients admitted to Leverndale Hospital with a diagnosis of schizophrenia in the four years 1967-1970 inclusive. Leverndale, a hospital of 1,036 beds, serves the catchment area of Glasgow south of the River Clyde, with a population estimated in June 1971 as 333,447. Glasgow shares many features in common with other large industrial cities in the United Kingdom, although relatively high unemployment and housing shortages are circumstances which might be expected to have an adverse effect on the rehabilitation of schizophrenics. The psychiatric services are somewhat unusual owing to the presence of three fairly large general hospital psychiatric units which are particularly inclined to deal with patients at an early stage of their illness and also not to admit patients under the compulsory procedures. One may expect, therefore, to see the effect of this selection, and a 'creaming off' of

less severe cases, in the type of patient admitted to the mental hospitals.

### METHOD

First admissions and readmissions of schizophrenics to Leverndale Hospital in the years 1967-70 inclusive were identified from a Kalamazoo card index system (which was in use in the hospital at that time.) First admissions were studied in more detail from case notes, and a follow-up survey was made of the state of these patients in December 1973, i.e. from three to six years after their initial admission. This follow-up was made by postal questionnaire to the patients' general practitioners, supplemented where necessary by telephone enquiry, by reports from colleagues in cases where the patient was still in contact with Leverndale, and in some cases by enquiry from other hospitals. Recruits to the long-term population in these years were ascertained by a survey of the long-stay male wards.

### Diagnosis

All cases under the diagnostic heading of 'schizophrenia' or 'paranoid schizophrenia' were included. If the diagnosis had been revised on discharge it was the practice to note this on the card and such cases were excluded. Diagnostic habits vary, but it is thought that the diagnosis here would probably be acceptable to the majority of psychiatrists in the United Kingdom. Most, though not all, cases had been seen by at least one consultant and one registrar. Most of the readmissions were well-known to the staff as established cases of schizophrenia.

The diagnoses of the 'first admissions' were reviewed at the time of follow-up, and four of the original cases were withdrawn in view of later information obtained; in retrospect, it appeared that the clinical presentation might

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in part at least have been attributable to organic or toxic conditions. One delinquent 15-year-old boy who had become psychotic showed only further delinquency without psychosis at follow-up, and there were some grounds for suspecting that his psychotic episode had been due to drug abuse. Two patients had died, one from alcoholism and hepatic cirrhosis, and one from bronchial carcinoma with probable cerebral metastases. The fourth patient was disabled by chronic bronchitis and alcoholism.

Two 'borderline' cases were, however, perhaps arbitrarily, included. These had been given alternative diagnoses of schizoid personality in one case and inadequate personality in the other, but in both there were well marked features of 'dysmorphophobia'.

#### RESULTS

##### *First admissions (45 cases)*

These were patients experiencing their first admission to a mental hospital for treatment of schizophrenia; among them were four who had been patients in a general hospital psychiatric unit shortly before this event. A further two cases were referred to us after being seen as out-patients at such psychiatric units. As a rule, these first admissions were at a relatively early stage of their illness, but the time of onset was often difficult to define, and at least two of the patients had been ill for many years before their first admission. Ages of the patients ranged from 18 to 63 years. Twenty-five were under and 20 over the age of 35.

Twenty patients (44 per cent of the total) were admitted under compulsory measures, 10 of them under Section 54 of the Mental Health (Scotland) Act, i.e. remanded by the courts for psychiatric report, and the remainder under Sections 31 or 24 (the normal compulsory procedures). This 44 per cent of compulsorily admitted patients can be compared with the 13 per cent of schizophrenic patients so admitted for the first time to the Royal Edinburgh Hospital in 1966 (Morakinyo), and suggests that the first admissions to Leverndale are a group selected for severity. The actual number of first admissions also appears low in relation to the population at risk and to the number of readmissions; only 17 per cent of the individual

schizophrenic patients admitted were first admissions, compared with 26 per cent in two other series in Edinburgh and London (Renton *et al.*, 1963; Wing *et al.*, 1964). It may be that more schizophrenics at an early stage of illness are treated first in one of the general hospital psychiatric units, and indeed 30 per cent of the patients in this series recruited to the long-term population proved to have been treated in one of these units, usually many years earlier.

Three of the 'first admissions' in this series have not been discharged and have now been resident for either 3 or 4 years. Of the remainder, the length of admission varied from two days to one and a half years. Two stayed for 11 months, one for 6 months, and the rest all for shorter periods.

##### *Follow-up of first admissions*

Twenty-two patients (48.8 per cent) were found to have been readmitted within a year of discharge. This is comparable with the figures of 43 per cent of readmissions within that time in the survey by Wing *et al.* (1964). Readmission within one year showed some association with a poor prognosis, since 88 per cent of the 11 patients who were in the least satisfactory state at follow-up had been readmitted in the first year, but 44 per cent of the patients who were doing well had also had such an admission. The average number of readmissions per patient was 1.5, with a range from nil to six admissions. This includes three patients who had left the area and were admitted to hospitals elsewhere.

A rough clinical grading as follows was made of the patients' condition and functioning in December 1973 (see Table I).

##### *GRADE I (Social recovery) (12 cases)*

These were all in regular open employment and no significant symptoms were reported. Eight of the 12 were on no medication, and they (or their families) had been seen by their practitioners only socially or for unrelated complaints. Some of these might be judged to have made a full recovery, but in most cases information was not full enough to make such a claim. The other 4 were on maintenance treatment with phenothiazines (intramuscular or oral), and 3 of those still attended the

TABLE I

| Condition of schizophrenic first admissions 1967-70 at December 1973 |                                        |                                           |                           |      |       |       |
|----------------------------------------------------------------------|----------------------------------------|-------------------------------------------|---------------------------|------|-------|-------|
| GRADE I<br>(Social recovery)                                         | GRADE II<br>(Mild/moderate disability) | GRADE III<br>(Moderate/severe disability) | GRADE IV<br>(In hospital) | Dead | Other | Total |
| 12                                                                   | 11                                     | 11                                        | 6                         | 1    | 4     | 45    |

hospital; their state of well-being was thought to be dependent on continued medication.

*GRADE II (Mild to moderate disability) (11 cases)*

These patients either had mild psychotic symptoms, usually intermittently, or appeared to suffer from a defect state. The two patients with 'dysmorphophobia' were placed in this grade. Six were in regular employment, though three of those had repeated absences from work, and another worked very occasionally, the rest being unemployed. Nine of these patients continued on medication, mostly prescribed by their general practitioners.

*GRADE III (Moderate to severe disability) (11 cases)*

None of these patients was working, and all had either persistent psychotic symptoms or a well-marked defect state. Some of these patients, as well as some of those in Grades I and II, had worked in the Leverndale Industrial Therapy Unit as day patients, but none was so engaged at the time of follow-up. Nine of them were on treatment, and five attended the hospital somewhat erratically for injections of fluphenazine decanoate or flupenthixol. One patient had moved to Northern Ireland where he was receiving intramuscular phenothiazines from the community nursing service.

*GRADE IV (In hospital) (6 cases)*

Three of these had become long-term patients from the time of their first admission, and two others from subsequent admissions, all having now been in-patients for at least three years. The sixth has been resident for only 17 months, but seems unlikely to be discharged.

*Dead (1 case)*

This man, aged 48, died of pneumonia about two years after his period of admission, and his

death was thought to be unrelated to his mental illness.

*Other (4 cases)*

These were patients who had left the area and about whom up-to-date information could not be obtained. Only one case, however, a Chinese waiter who moved to England, was completely lost to follow-up after leaving hospital. Two patients who were thought to have poor prognoses were known to have had subsequent admissions to hospitals in England. The fourth patient was known to have been keeping well for a year after one early relapse.

*Readmissions*

These form the background against which the other figures can be seen, and clearly represent the main bulk of the hospital's work with schizophrenics.

In many cases the 'revolving door' pattern appears to be operating: 215 individuals accounted for 426 admissions over the 4-year period. Thirteen patients had five or more admissions each, the greatest number of admissions for an individual being 14.

It will be seen (Table II) that there is a substantial fluctuation in the number of re-admissions, from a peak of 130 in 1968 to 91 in 1970. One would like to think that this was a result of more effective treatment, especially since it was about this time that the long-acting phenothiazines came into general use. It would be difficult, however, to reach any firm conclusion from these figures. The fall in re-admissions of schizophrenics has been more or less parallel to the fall in total male admissions. The figures for female admissions are given for comparison (Table III). It can be seen that the admission of female schizophrenics showed some fluctuations, but these were not parallel with the

TABLE II

| Year   | Total male admissions | Male schizophrenics admitted to Leverndale Hospital |                          |                                  |
|--------|-----------------------|-----------------------------------------------------|--------------------------|----------------------------------|
|        |                       | 1st admissions                                      | Re-admissions            | Still in hospital 3-6 year later |
| 1967   | 501                   | 7                                                   | 112                      | 9                                |
| 1968   | 584                   | 14                                                  | 130                      | 11                               |
| 1969   | 467                   | 16                                                  | 93                       | 12                               |
| 1970   | 426                   | 8                                                   | 91                       | 7                                |
| Totals | 1,978                 | 45                                                  | 426<br>(215 individuals) | 39                               |

TABLE III

| Year   | Total female admissions | Total female admissions for schizophrenia |
|--------|-------------------------|-------------------------------------------|
| 1967   | 498                     | 105                                       |
| 1968   | 451                     | 113                                       |
| 1969   | 525                     | 129                                       |
| 1970   | 578                     | 107                                       |
| Totals | 2,047                   | 454                                       |

male figures: the total female admissions rose in proportion as the male admissions dropped, the number of admissions to the hospital as a whole remaining more or less constant at about 1,000 per year. It is likely that the increasing demand for female psychogeriatric admissions is the major cause of these variations. In 1969 one of the male non-geriatric wards was closed, and re-opened to accommodate female psychogeriatric patients. There was a greatly reduced availability of male beds at this time, and this no doubt largely accounts for the fall in male admissions. These changes in the hospital's function, however, would not have been possible without a gradual fall in demand for long-term male non-geriatric beds. The figures are at least consistent with some improvement in the outlook for male schizophrenics and should serve as a basis for comparison with future surveys.

#### *Recruits to long-term population*

Of the patients admitted in the years of the survey, 39 have not been discharged to date and have now been resident for from 3 to 6

years. Five of these patients had been admitted for the first time in these years. A fuller study of these patients is being made, but it can be stated now that they had an average age of 45 years and that most of them had a long psychiatric history. This rate of accumulation seems similar to that reported from Salford (Fryers, 1973) where 12 long-stay male schizophrenics had accumulated over a four-year period from a catchment area population of 130,000, although in that series 'long-stay' was defined as a stay of over one year.

#### SUMMARY AND CONCLUSIONS

The results show that 83 per cent of the male schizophrenics admitted to Leverndale Hospital in the years 1967-70 were readmissions and thus suffering from relapsing or continuous illnesses. The proportion of first admissions for schizophrenia (17 per cent) appears to be lower than is usual in areas where there are not separate psychiatric units of appreciable size in general hospitals, and the definition has been stretched to include several cases whose treatment actually began in the general hospital units but who were transferred to Leverndale either directly or after a short period out of hospital. That these units exercise a selective function in the type of case admitted to them—and hence the type of case considered appropriate for the mental hospital—is probably borne out also by the high proportion (44 per cent) of compulsory admissions among these 'first admission' patients.

Follow-up of the first admissions showed approximately equal numbers in three grades of clinical state living outside hospital, and a smaller number who were long-term in-patients. It is noteworthy that a majority of the patients showing the highest degree of clinical and social recovery were on no treatment, whilst a majority of those who were most deteriorated were receiving or at least being prescribed medication, in some cases intramuscularly. This is not to suggest that treatment has no effect, but does draw attention to its present limitations. What appears to emerge is the strong influence of the 'natural course' of the illness, on which our physical treatments and psychological and social manipulations attempt to operate with varying degrees of success.

If these are the results in relatively new cases of schizophrenia, the results in the much larger number of readmitted cases are not likely to be better. This indicates a considerable amount of psychiatric morbidity and strain on the families concerned within the community. If present trends continue, there appears to be an appreciable number of patients who will be future candidates for long-term care, especially with the incapacity or death of elderly relatives on whom many depend (Stevens, 1972).

The fluctuation in the numbers of re-admissions over the four-year period is difficult to interpret, and the fall in the last two years may be largely due to reduced availability of beds. This reduced availability of beds, however, has been an indirect result of the run-down in long-term non-geriatric wards, and probably does reflect some real improvement in the outlook for schizophrenics.

The number of patients becoming 'long-term', which in this study means a stay of over three years, is small in each year, but is cumulative, adding an average of 9.8 patients per year whose average age at present (not on admission) is only 45.

Practical conclusions are that provision has still to be made for such long-term patients, and there is no convincing evidence at present to suggest that this recruitment of patients will sharply reduce. If it does reduce, this is more likely to be in a very gradual fashion, perhaps due to delay of the eventual long-term admission. Community services in Glasgow at present are poorly developed and should be improved. This would no doubt improve the position by helping to ensure that each patient in the community had the necessary treatment and rehabilitation, and thus remained at the best level possible. Some patients might reside in hostels or group homes, but this would not necessarily make a radical change in their clinical state. The question of whether the mental hospital is the best place to deal with all those patients who

require residential care remains unanswered, but at present there is no alternative offering equivalent facilities.

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## A Case of Multiple Tics with Vocalisation (Partial Syndrome of Gilles de la Tourette) and XYY Karyotype

By H. MERSKEY

Multiple tics appear in the population with a frequency estimated at from 1 in 1,000 child psychiatric out-patients (Lucas *et al.*, 1967) to 1 in 12,500 out-patients (Ascher, 1948). The incidence of XYY karyotype is about 1·24 per thousand males (Nielsen and Christensen, 1974). The occurrence of multiple tics with vocalization in a patient with the XYY chromosome constitution strongly suggests that the extra chromosome promotes neurological abnormality.

A man born in 1954 was seen in September 1973 for headaches of seven months' duration. The headaches resembled migraine. During the same period he had suffered from attacks of loss of consciousness without any warning, lasting for a few seconds. One of these had caused a fall, and his wife described how in attacks he went limp, lay still, breathed heavily and recovered within a few seconds. There was an extensive history of aggressive behaviour, including sticking a broken bottle in the face of a stranger in the course of an argument. Another feature, of which he did not complain spontaneously, was the occurrence of multiple small tics of the face, shoulders and limbs accompanied by grunting sounds. The tics had been present since the age of 15, but were never accompanied by coprolalia.

His parents were happily married, but his father was strict. He had been delinquent in childhood, with four Court appearances for housebreaking, and he had been unhappy at school, from which he often played truant. He had learned to read and write, but his arithmetic was poor and both his father and brother appeared to have better educational attainments, his father being a shop steward who would write up minutes of meetings. He had had some six jobs as a butcher, all of which he had

left because of arguments with people or a feeling that he was being ill-treated.

In October 1965 a fracture with separation of the extreme tip of the tubercle of the right scaphoid was noted. In February 1966 he fractured the distal pole of his left scapula. At that time a click on supination of the left forearm and extension of the elbow was noted; this had been present since an injury at the age of 5. In April 1966 a minor incomplete fracture of the ulnar side of the proximal end of the left fifth metacarpal was noted, as well as a fracture of the proximal end of the second left metacarpal. In February 1971 a complete transverse fracture of the right fourth metacarpal was diagnosed.

The doctors at the hospital where he was seen for these fractures wondered whether he might have an adolescent epiphysitis. They noted that his growth was much advanced at the age of 13 and that his external genitalia were very well developed. Measurements of his 17-oxosteroids and 17-oxogenic steroids in the urine were like those of an adult male (17-oxosteroids 6·2 mg. per 24 hours, normal adult range 2·5-13; 17-oxogenic steroids 13·3 mg. per 24 hours, normal range 3-15).

He had been knocked out twice. Once, when he was aged 12, a car hit him and he woke up 1½ hours later. The second incident occurred during a fight, and he had diplopia for five minutes on coming round. He had also engaged in amateur boxing.

Physical examination showed a tall man of height 6 ft. 2 in. No other abnormality was noted.

Psychiatric examination indicated a man of below average intelligence but with quite good rapport and concern about his behaviour.

Investigations resulted as follows: ESR 4 mm.

in 1 hour, haemoglobin 15.6 g./100 ml. (107 per cent), PCV 45 per cent, MCHC 34 per cent, white cell count 7,500—normal distribution; normal amino-acid chromatogram; normal X-ray of chest and skull. The pituitary fossa was rather small, but normal. Electroencephalogram showed a symmetrical and responsive alpha rhythm at 9 cycles per second. Evoked potential studies (Dr. A. M. Halliday) showed essentially normal somatosensory responses. Psychometry (Mr. James Stevenson) on the Wechsler Adult Intelligence Scale showed a Verbal IQ of 88 and a Performance IQ of 101, without any evidence of organic intellectual impairment. Chromosome sexing, undertaken by Dr. David Hughes (Institute of Child Health) was reported as follows:

'Blood culture for cytogenetics: 10 cells—47 XYY male karyotype with extra Y chromosome confirmed by G banding and QM fluorescence.'

'Buccal smear for cytogenetics: No X chromatin could be found in 100 nuclei as expected in males. Double Y-chromatin positive nuclei, revealed by QM fluorescence—indicating XYY sex chromosome constitution.'

No special significance can be attached to the headache in this case. Like headache, epilepsy is a common disorder, but an association between epilepsy and the syndrome of Gilles de la Tourette has been suggested by Guggenheim and Haynal (1964) and by others. The rarity of both the XYY karyotype and the syndrome of Gilles de la Tourette suggests that their occurrence together is more than a coincidence. Daly (1969) found an association of intention tremor with the XYY constitution, and although Harrison and Tennent (1972) did not find this association to be a strong one it is

supported by the findings of Baughman, Higgins and Mann (1973). The evidence so far suggests that the XYY karyotype does predispose to some forms of neurological abnormality, of which tremor and tic may be representative. In this respect it is important that an association has also been found between parkinsonism and Klinefelter's syndrome (Hunter, 1969). Weingarten (1968) has argued fairly strongly that various cerebral diseases affecting the extrapyramidal system may release the syndrome of Gilles de la Tourette. This syndrome may be found in women as well as men, so that it cannot solely be due to the XYY karyotype, but the latter may prove to be one predisposing factor.

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## Concepts and Methods in Student Mental Health

By C. J. LUCAS and SIDNEY CROWN

Considering their potential contribution to the community, the growth of clinical services in relation to the specialized mental health problems of students in higher education has been haphazard. Although most universities have developed or are on the way to developing comprehensive health services on the lines recommended in the report of the Royal College of Physicians (1966), services in the non-university sector are often less than adequate. This report accepted as established that about 5 per cent of students have psychological disorders which cause serious distress, and a further 10 to 20 per cent have less severe though handicapping disorders. It was accepted that special provision would need to be made for these mental health problems, as part of the range of preventive and treatment activities relevant to a College community.

The influences on the development of clinical services for psychologically disturbed students have been various. Contributions have come from medicine, psychiatry, psychoanalysis, education, educational psychology, psychometrics and counselling, both religious and secular. It is not surprising, therefore, that the theoretical concepts used are confused and the methods often pragmatic. There are a number of reasons for attempting to clarify these concepts and methods at the present time. First, psychiatric, medical and counselling services in universities are going through a phase of reappraisal and change, and the inter-relationships of various methods of help-giving are being examined. Second, new services in the non-university sector of higher education are developing, and structures determined now will set patterns for the future. Third, there is a growing recognition of the general lack of services for adolescent and late adolescent psychological problems. The development of new services, their structure and methods of operation, will inevitably be

based on conceptual models involving ideas about 'health' and 'ill health', 'psychiatric disturbance' or 'normality'; these models carry crucial implications for case management. Fourth, models are important because of the way users relate to a service. Misunderstandings may arise from a 'badness of fit' between models. A non-working student, for example, sees his problem as educational, relating to deficiencies in his course, while his tutor perhaps uses a moral model and labels it 'laziness'; alternatively he sees the student as 'disturbed' (illness model) and hopes that psychiatric treatment can put him right. The psychiatrist may find him not 'ill' but unmotivated (psychological model). All models may have some explanatory usefulness, but unless the parties involved have some way of agreeing within which framework problems can be resolved confusion is likely to result. Finally, conceptual models dictate research strategy. Too often problems have been looked at solely from within the framework of a particular model, thereby limiting the scope of the observations made.

### BACKGROUND

The historical development of student health services in Great Britain has been well described by Mair (1967). In the years before the first world war, two models were implicit in the thinking, the medical and the educational-spiritual. These were regarded as unrelated. 'Health' was located within a physical illness-fitness dimension and was therefore seen as something exclusively within the medical model. The limited activities which were initiated at that time took the form of efforts on the one hand to identify physical illness and on the other hand to promote 'fitness' by the encouragement of physical exercise. All other problems were seen as being properly the con-



cern of educators and religious advisers. Development continued in the years between the wars largely in terms of the same two models.

Psychiatry entered the scene in universities in the 1950's in terms of the recognition of morbidity from major psychiatric illness and of suicide (Parnell, 1951). The interest and alarm thus generated led over the years to increasing recognition of a wide range of problems. Early studies were largely on the basis of descriptive models. The preoccupations were with syndrome identification and classification, with prevalence studies, with aetiological factors, with treatment and with prevention (Still, 1959; Read, 1954; Davy, 1960). Nosological problems were as difficult as those in general psychiatry, but nonetheless much useful clarifying work was done. Malleson (1957) showed a number of patterns of reaction to examination stress. Kidd, in a series of cohort studies (Kidd, 1965, 1966; Kidd and Caldbeck-Meenon, 1966) attempted to relate severe and less severe psychiatric morbidity to social, educational and intellectual factors. He noted a relationship between severe disturbances and dropping-out, as did Lucas, Kelvin and Ojha (1966). The techniques of psychiatric epidemiology in these studies were limited by the resources available.

Psychodynamic ideas derived from the various psychoanalytic schools had little impact in this country on University Health Services until the 1950's. However, the Princeton Conference chaired by Erik Erikson gave impetus in this direction (Funkenstein, 1956). There was a growth of interest in processes of psychological development, internal conflict, crises with 'normal' or pathological resolutions. Interest extended, in other words, from description to attempts to explain processes.

The importance of models derived from psychiatry and psychoanalysis remains. Psychological models, both cognitive and behavioural, have increased in sophistication and range and must also be included, as must models deriving from the Counselling movement. Further, through the influence of sociology, the significance of institutional processes has achieved a greater recognition. It has become clear how profoundly the pressures arising from institutional goals and values (whether explicit or not)

impinge upon individuals and how differently individuals may respond. It is necessary to focus on interactions between individuals and context. In the next section we have attempted to indicate the relevance of these various models.

#### THE MEDICAL MODEL

With a decline of an 'educational-moral' model, an illness model became popular—perhaps over-popular—among educators. Effective work performance, in particular, became a criterion of good mental health. From this it followed that work difficulty was a result of psychological disturbance which should therefore be treated.

Defined in this way both organization and individual shed responsibility, and this was shifted to the physician or psychiatrist, whose duty it was to remove the 'illness' by appropriate treatment. The conceptualizing of problems within a mental health framework did, however, lead to genuine advances in clinical knowledge. It became clear, first, that severe psychological disturbances of college students (psychosis, severe psychoneurosis, and major personality disorders) form perhaps 1–5 per cent of the problems justifiably subsumed within a psychiatric illness model. Secondly, it led to the recognition that 10–20 per cent of students suffer from psychosocial, psychosexual and psychosomatic problems not easily subsumed under a formal psychiatric nosology. A number of these disorders related to stresses unique to higher education. Work-inhibiting (and work-potentiating) neuroses are the occupational mental health problems of higher education (see reviews by Lucas and Linken, 1970 and by Ryle, 1969).

One consequence of this conceptualization was the tendency to place disturbance in one of two categories: 'major psychiatric illness'—needing management by a psychiatrist, and 'minor disturbance'—requiring simple treatment by a general practitioner. Any psychiatrist working in the field, however, soon came to realize that the second category was neither as minor nor as simple as had been supposed, and that considerable skills were called for in their understanding and management. Probably as a reaction to this there developed a tendency to

abandon nosology and to focus on aetiology in terms of psychodynamic understanding. Psychoanalytic models, in their early form, however, tended to concentrate on intrapsychic conflict and to discount other parameters of development, particularly the inborn and the social. While the therapeutic outcome of this change in attitude was constructive in that it led to the development and adaptation of methods of brief individual psychotherapy and group psychotherapy, it is unfortunate that an excessive concentration on aetiology and on treatment tend to go hand in hand with lessened interest in research.

In our view a contemporary stimulus to further progress in student mental health may lie in the focussing of research on to the interaction between social and psychological processes. We draw attention to three areas. Goldberg, Cooper, Eastwood, Kedward and Shepherd (1970), working within the research sector of primary medical care (general practice), have developed a standardized and progressively unfolding type of clinical interview which follows up particular areas of psychiatric history and mental state examination as revealed by positive answers to 'key' questions. Wing, Birley, Cooper, Graham and Isaacs (1967) have objectified the examination of mental state (Present State Examination). Brown, Sklair, Harris and Birley (1973a) and Brown, Harris and Peto (1973b) make some important points in discussing the interrelationships of life events (such as bereavement or parental separation) and the onset of psychiatric disorder. Their distinction between formative and triggering events, the need to establish base line events in different groups, and their concepts of social factors with both adverse and protective effects would seem very relevant to student populations.

Such researches point the way to future developments in methodology. Given that objective and flexible methods of clinical assessment have been developed, these could be used not only to check earlier findings in relation to the definition and prevalence of psychiatric disorder in students but also to re-examine aetiology in psychological and social-cultural terms. An example of an attempt to do

this within a limited area is the research by the present authors on study difficulty (Crown, Lucas and Supramaniam, 1973). Analysis of symptom patterns indicated that it was possible to delineate psychoneurotic and motivational components. A second research currently in progress is attempting to relate personality factors to the different patterns of study disturbance. At a later stage we hope to explore how emergent patterns relate to social-cultural factors.

In our view, therefore, the medical model in modified and updated form retains considerable interest both for the replication of previous epidemiological findings and to advance understanding of psychological and social factors in aetiology.

#### PSYCHOLOGICAL MODELS

In an interesting review of psychology in relation to psychiatry, Zangwill (1973) differentiates two groups of models, the physiological which remain essentially behaviourist in method and the cognitive which accept in principle the existence of conscious events. Cognitive models assume that complex processes intervene between stimulus and response, these hypothetical linking processes forming our theories of personality. Cognitive psychology is of considerable importance theoretically because it underlines the link between apparently diverse models derived from academic psychology and psychoanalytic psychology—an essential step for the ultimate analysis and understanding of personality. From the physiological model theories of learning are derived which find their clinical expression as the behavioural psychotherapies.

##### *Cognitive models*

The two cognitive models most relevant to student mental health are the psychometric and the psychodynamic.

##### *Psychometric models*

Psychometrics concentrated initially on the analysis of intellect. The fundamental statistical advances made initially by Spearman in the 1920's were developed in the next three decades by Thurstone (in the U.S.A.) and by Burt (in

Great Britain) to reach their purest expression in the work of Guilford and his collaborators (Guilford, 1957). Psychometric methods were also used to analyse objectively the emotional and motivational components of personality, the best known research programmes in this country being those of Eysenck and of Foulds; in the U.S.A. that of R. B. Cattell.

In higher education systematic attempts have been made to define and measure characteristics of successful students or of those who have failed in defined ways (examination assessment, leaving college, etc.). This research (Furneaux, 1962; Entwistle and Entwistle, 1970; Miller, 1970; Entwistle, Nisbet, Entwistle and Cowell, 1971; Entwistle and Brennan, 1971) suggests fairly clearly that measures of intelligence, personality and educational attainment, combined in the most statistically accomplished ways, give at best only a moderate prediction of academic success or failure. On the other hand, some of the research findings that have been confirmed across a number of studies are of theoretical interest and in need of replication and extension. The frequently noted complex relationship between emotional instability and academic success or failure is possibly the most pressing of these. Emotional instability can relate to a spectrum of academic results from the highest possible success to total failure. A broad personality factor such as extraversion can vary in its predictive success according to its combination with stability or neuroticism. Non-cognitive factors relating to study difficulty can be divided into emotional and motivational components. Various interesting and complex relationships then emerge. A measure of work satisfaction, for example, seems to have a complex and as yet unclear relationship to intervening personality variables such as neuroticism and obsessiveness; and phobic anxiety has a positive relationship to academic attainment (Crown *et al.*, 1973). Of the newer concepts, the most interesting, involving both intellect and emotion, are those stimulated by Guilford and called by him 'convergent' and 'divergent' thinking (Guilford, 1957; Hudson, 1968). These concepts have been developed and extended by others, leading to the study of 'creativity' (Getzels and Jackson, 1962) and

more recently to the concepts of syllabus-boundness-syllabus-freeness (Parlett, 1969). Operational definitions of these concepts in test form are being attempted, but basic validation and reliability studies remain to be carried out.

#### *Psychodynamic models*

Psychodynamic psychiatry includes aspects of psychoanalysis, analytical psychology, social case-work, crisis intervention and existential psychiatry. This remarkable mixture relates to the way psychiatry has filtered through to college students through the personnel involved: general practitioners, psychiatrists, psychotherapists, clinical psychologists, social workers, welfare officers and counsellors. The loosely knit ideas which have evolved about, for example, anxiety and defences, psychosexual development, conflict and interpersonal relationships have provided a framework for the treatment of a number of problems, not unique to the college setting but of special importance to it. These include acute stress responses, relationship and psychosomatic problems, problems relating to identity (crises, confusion, diffusion) and role; sexual deviance; clashes with authority and society; study difficulty; drug dependency. The disadvantage of psychodynamic models of all types is that they tend to lead to the expectation that every problem situation requires an 'appraisal' in depth and change on the part of the individual by means of a psychotherapeutic experience.

While it seems likely that psychodynamic theories and the therapies derived from them will retain their relevance to some of the problems encountered in college health services it is becoming increasingly obvious that there are basic problems of theory and practice which need critical re-examination. Psychodynamic concepts are not only in urgent need of clarification (Sandler, Dare and Holder, 1973) but also need definition in terms which can lead to methods of measurement and testing (Crown, 1974). The problems involved in achieving this, discussed extensively in recent writings (Gottschalk and Auerbach, 1966; Meltzoff and Kornreich, 1970; Luborsky and Spence, 1971; Bergin and Strupp, 1972) probably account in

part for the interest a number of psychodynamically orientated psychiatrists have evinced both in Kelly's personal construct theory (Bannister and Mair, 1968) and more especially in the technique of measurement derived from it, the repertory grid. This technique seems to hold great potential for objectifying much that goes on during psychotherapy. In the context of a University Health Service it has been used to measure change with individual psychotherapy (Ryle and Lunghi, 1969); an adaptation of the technique, the dyad grid, has been used to examine complex interactions between several persons (Ryle and Lunghi, 1970).

As well as theoretical clarification and objective observation and measurement of psychodynamic concepts, there is an urgent need with cost-benefit in mind to investigate the best methods of conceiving brief psychotherapy and developing methods of teaching and training. There is also the need for research into the therapeutic potentiality of combinations of cognitive therapies (e.g. individual and group therapy) and of combinations of cognitive therapies with the behavioural therapies (Marks and Gelder, 1966; Marks, 1971).

#### *Behavioural models*

It has become increasingly clear that all psychotherapies involve both cognitive and behavioural change. Thus a recent analysis (Crown, 1973) of factors possibly related to all methods of psychotherapy (the dynamic therapies, individual and group; marital and family therapy; behavioural psychotherapy; and informal or peer group therapies) suggested three components: (1) insight and relationship (cognitive); (2) practice or working through (behavioural); and (3) conditioning, which would include both cognitive-verbal and behavioural aspects.

It seems appropriate, too, that behaviour therapy should be renamed behavioural psychotherapy, since it involves a complex mixture of cognitive and behavioural techniques (Lazarus, 1971). The basic techniques of the behaviour therapies (Gelder, 1972) are (1) desensitization, with relaxation or other methods of increasing reciprocal inhibition of the anxiety response;

(2) implosion or flooding; (3) operant conditioning; and (4) aversion therapy. Active research areas involve the use of social learning (e.g. modelling) techniques (Bandura, 1968); research into how far techniques, to be effective, need to involve actual behaviour, and what can be achieved with techniques such as Covert desensitization or aversion in imagination (Rachman and Teasdale, 1969); and conjoint marital therapy using behavioural techniques (Stuart, 1969; Stern and Marks, 1973).

The behavioural psychotherapies have an important role in relation to the sort of problems with which a college health service has to deal in substantial numbers. Psychosexual difficulties, social anxieties, including speaking in front of small or large groups, examination phobia, speech difficulties, may all be approached by behavioural methods. Their ultimate role and appropriate combination with the dynamic psychotherapies and counselling techniques is an important area for investigation.

#### COUNSELLING MODELS

Dissatisfaction with the illness model and with the complex cognitive models underlying the psychotherapies, relating in part perhaps to the inability of therapists of all schools to fulfil expectations, has led to the desire, in recent years, to view 'crises', and other problems of young people as part of 'normal' life and development. They are not 'sicknesses', so treatment is not called for. 'Patients' become 'clients' and 'therapists' become 'counsellors' who use methods which are not treatment. Counsellors have themselves developed a range of models (Newsome, Thorne and Wyld, 1973). The core technique of counselling derives from Rogers' client-centred approach. This is a reflective rather than an interpretative therapy. Clarification of the client's problems is aimed for, but the basic data brought to the interaction by the client are adhered to and not 'interpreted', i.e. given an alternative meaning, as in psychoanalysis and derivative therapies. Truax and Carkhuff (1966) particularly have been active in investigating the effectiveness of client-centred counselling. They have been able to relate effectiveness to characteristics of the therapists, such as empathic ability, warmth and

genuineness. Other techniques of counselling relate more closely to existential psychotherapy (Frederick, 1972) or to behavioural psychotherapy (Nelson-Jones, 1972).

In the U.S.A. the counselling movement is developing in a number of ways: it is becoming less wholly consulting-room and one-to-one based; appropriate group methods are being explored, e.g. 'crisis groups'; clerical staff are being trained in interpersonal relations to improve their dealings with students; 'peer' counsellors are being trained (Shaevitz, 1973). These are indications of greater involvement of the counselling service with the university community and lead directly to the last of the conceptual models we wish to consider: the social-interactional.

#### THE SOCIAL-INTERACTIONAL MODEL

A number of factors have contributed to the rise in importance and relevance to student mental health of the social-interactional model. First, psychological models, psychodynamic and behavioural, relate essentially to the individual, and may seriously underestimate the importance of the social dimension (Crown, 1974). Second, there have been basic advances in theory and suggestions for therapy deriving from the social sub-sciences—sociology, social psychology and social psychiatry. Third, is an increasing realization of the importance to student mental health and ill-health of the institutional environment (Ryle, 1969; Lucas and Stringer, 1972). This environment includes a whole range of complex and interrelated aspects: for example, the course content and the methods of teaching; methods of assessing and examining, tutorial systems, and the degree of contact between students and staff. The various living conditions (hall, lodgings or home) all pose their particular problems, and relationships within the family continue to be of major importance.

The interaction between individual and environment is being increasingly recognized in contemporary sociology. Thus, a concept as fundamental as deviance (Becker, 1964) is defined in terms of an 'actor' (person or subject) and societal reaction to the actor. A disturbance of function, such as study difficulty, may relate

closely to interactional factors between student and college environment—as for example in the alleviation of study difficulty following a change of course or place of study.

While the importance of social factors has long been recognized in psychiatry, it is only recently that the methodological problems of linking social events with psychological disturbance have been tackled critically (Brown *et al.*, 1973a, b). The psychological disturbances of students, which are often related to the critical transitions which occur from leaving school to completing a degree, would seem a promising testing ground for these research methods. It will be necessary to delineate criteria to provide a base line of 'events'. Given such a base-line, the significance of changes in different groups could be evaluated.

It is unhelpful to attempt to restate all the psychological disturbances of students in social terms. However, in recent years sociology has developed a number of complex concepts relating individual psychological factors to particular features of social environments. These include role, status, stigma, illness behaviour, reference groups, labelling theory (Mechanic, 1968; Jefferys, 1969; Roman, 1971; Pahl, 1972). These concepts, while theoretically stimulating and clinically relevant, share with many psychodynamic concepts lack of precision and difficulty of measurement (Jeffereys, 1969).

From social psychology the new wave of real-life experimental paradigms, for example, the analysis of, and experimentation on, social skills (Argyle, 1972), has led to advances in the study of communication, both verbal and non-verbal (Hinde, 1972). Social skills can be analysed as can, for example, a motor skill, and the manipulation of social skill or lack of social skill is possible. From this follows the possibility of therapeutic techniques of particular relevance to college students, for example role-playing and assertiveness-training.

Of the models discussed, the socially-based models are both the newest entrants to the field of student mental health and perhaps the loosest of definition. If, however, as we believe, an informed and critical eclecticism is essential to future development in this area then the involvement of the social dimension is crucial.

## CONCLUSIONS

Our main conclusions are:

1. Conceptual models on which psychiatric practice in a University or College setting is based are of four main types: medical, psychological, counselling and social-interactional. The models adopted have important implications for the institution and its personnel, both staff and students. They determine the way psychological problems are appraised and managed.

2. No model at present or in the foreseeable future is likely by itself to encompass more than a limited range of human behaviour, and it is simplistic to think in terms of a single model.

3. Every model needs conceptual clarity so that terms are defined with the need in mind for developing objective methods of observation and measurement.

4. Methods of treatment are implied by, and can be derived from, a number of the theoretical models. The treatment of an individual student may involve a single method or various combinations of methods. Conceptual myopia and restriction of treatment choice must be avoided.

## SUMMARY

Some of the changes which have taken place in the models on which psychiatric practice in a University or College setting is based are described. The practical consequences of different models are emphasized. Epidemiological analysis, which followed the recognition of the more serious disturbances and of suicide, effectively mapped out basic prevalence figures. The nosology of psychosexual, psychosocial and psychosomatic problems, however, remains confused, and the use of currently available methods of objectifying the clinical psychiatric examination is needed. The contributions from psychodynamic studies introduced a new frame of reference of heuristic value and led to formulation of problems in terms of concepts such as intrapsychic conflict and identity. Currently the main models are medical; cognitive-psychological; behavioural-psychological; counselling; and social-interactional. A variety of treatment methods relate to these models. Psychological treatments include the dynamic psychotherapies, individual

and group; marital or couple therapy; the behavioural psychotherapies; counselling; and socially based techniques such as role-playing and assertiveness training. Future research should aim both at theoretical clarification and at cost-benefit assessment in order to select for different disorders and different patients the most appropriate treatment methods or combination of methods.

## ACKNOWLEDGEMENT

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## Synopses of Papers Awaiting Publication

### **The First Seventy Admissions to an Adolescent Unit in Edinburgh: General Characteristics and Treatment Outcome.** By R. FRAMROSE.

The Young People's Unit admits adolescents of both sexes from fourteen to twenty years of age. The regime is permissive and democratic. Treatment is directed towards a psychotherapeutic resolution of family psychopathology and the achievement of maturational progress for the adolescent.

Data from the first seventy admissions are examined. About two-thirds of the patients were diagnosed 'developmental crisis', the majority having an underlying personality disorder. There was evidence of considerable psychopathology amongst other family members, and examination of family attitude ratings showed a reversal of 'normal' patterns.

The average length of stay in the Unit was from six to nine months. Seventy per cent of patients were improved at discharge. Psychotic and neurotic patients did best, while impulsive, antisocial adolescents with highly disturbed behaviour derived least benefit from this regime. This has been a common finding in other adolescent units.

It is felt that the relatively primitive level of personality organization found in very disturbed, impulsive adolescents does not allow them to make full use of this type of regime. It is suggested that the treatment of very disturbed, antisocial adolescents necessitates an increased provision of specialized units, offering containment and intensive care to these patients.

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### **The Brain Stem in Psychosis.** By M. FISMAN.

The brain stems of 24 mental hospital patients and 10 control patients were examined. Ten mental hospital patients presented with delusions or auditory hallucinations in clear consciousness, and of this group 8 were diagnosed as schizophrenic syndrome. The most prominent findings were age-related changes in the midline reticular nuclei; and glial knots and perivascular infiltration in the trigeminal nucleus of 6 out of 7 schizophrenic patients (the

eighth patient was found to have carcinoma of the bronchus with cerebral secondaries). The latter findings are discussed with regard to evidence for the presence of a persistent latent virus (herpes zoster) and the possible role that this may play in the genesis of the schizophrenic syndrome.

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### **Suicide in Dublin:**

#### **I. The Under-reporting of Suicide in Dublin and the Consequences for National Statistics.**

By P. DESMOND MCCARTHY and DERMOT WALSH.

The authors examined coroners' records for Dublin city and county between 1964 and 1968 and made a decision on the 'balance of probabilities' from the evidence available whether death was suicide or not. They compared the rates so determined with those of coroners' verdicts returned 'beyond all doubt' and found that they 'diagnosed' suicide four times more frequently than the coroners returned a suicide verdict on the same cases.

The study also examined the possibility that when deaths from suicide, accidental deaths from those causes of death likely to be suicide, and deaths undetermined whether accidentally or purposely inflicted were aggregated, the Irish death rate from these combined causes would equal that of England and Wales and that of Scotland, and that therefore the official low Irish suicide rate would be explained by the misclassification of suicidal deaths as accidental deaths and deaths undetermined. This explanation was rejected because the combined Irish death rate in 1968 from the three causes was only 65 per cent of that of the other countries.

It was concluded, therefore, that despite considerable misclassification, Ireland's suicide rate was genuinely low by comparison with those of England and Wales and of Scotland.

#### **II. The Influence of Some Social and Medical Factors on Coroners' Verdicts.** By DERMOT WALSH, BRENDAN WALSH and BRENDAN WHELAN.

This is a study of 201 deaths, all of which were classified as 'suicide' by two psychiatrists but only 58 of which were officially returned as suicides by

coroners. A linear probability function was used to isolate the factors that led coroners to return the suicide verdict. It was found that the subject's age, the method by which death occurred, and whether any intimation of suicidal intent had been given, affected the verdict. Younger subjects, those who died by cutting, hanging, drugs and gas and those who intimated an intention of suicide were more likely than others to be returned as suicides by the coroners.

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#### **The Lesion in Stereotactic Subcaudate Tractotomy.** By RAYMOND NEWCOMBE.

The stereotactic subcaudate tractotomy procedure described by Knight appears to be of value in some cases of chronic psychiatric illness, particularly intractable depressive illness. The radiological placement and size of these lesions was derived empirically from experience of the modified orbital undercut operation. A recent anatomical variability study of the frontal lobe based on 24 normal brains has helped to define more precisely the anatomical position of these lesions. In general, the posterior half of these lesions lies in a subcaudate position and the anterior half, for the most part, lies beneath the central segment of frontal white matter. The lesions do not extend to the posterior limit of the frontal lobe or into the substantia innominata. A small variation in lesion placement is caused by anatomical factors and the method of lesion production, although the size, shape and time for development is relatively constant.

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#### **Unilateral Electroconvulsive Therapy: How to Determine which Hemisphere is Dominant.** By ELIZABETH A. CLYMA.

It is now well recognized that unilateral non-dominant ECT has many advantages over bilateral, but unilateral dominant ECT is thought to be more disruptive than bilateral.

Some workers give unilateral ECT routinely to the right-side of the head in right-handers. Pratt and Warrington (1971, 1972) give one of the first two treatments to each side of the head and measure re-orientation by a simple test.

In this study, their test was used in 52 courses of

unilateral ECT, given to 49 patients, in order to study three specific problems.

1. If all completely right-handed patients with no familial tendency to sinistrality had been given right-sided ECT routinely, 11 per cent would have received their treatment to the dominant side.

2. The test devised by Pratt and Warrington was superior to simply asking the patient his name, as a means of discriminating between the two hemispheres.

3. Errors in determining which side is dominant can occur if the first two treatments are compared. Dominance was established in only 46 per cent of subjects at the first and second treatments, but in 82 per cent by comparing the second and third.

It is suggested that the first treatment in a course should be bilateral and that comparison of sides is done at treatments two and three.

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#### **A Technique of Insight-directed Psychotherapy for Health Service Use.** By F. P. HALDANE.

A method suitable for once a week individual or group psychotherapy is discussed, with its theory and technique. It is compared and contrasted with the method of psychoanalysis. The method promotes independence and curtails excessive transference relationship. It requires much less training investment than psychoanalysis, and seems safe in relatively inexperienced hands, provided the simple technique is adhered to. It is equally applicable to short treatments of a dozen or so sessions and to longer treatments of a year or more. It is suggested as suitable for Health Service use.

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#### **Information Leading to Accurate Diagnosis in the Elderly.** By J. M. KELLETT, J. COPELAND and M. KELLEHER.

The process of psychiatric diagnosis was studied in patients over the age of 65 admitted to a psychiatric hospital, to a psychiatric-geriatric assessment unit, and to a geriatric hospital.

The diagnoses were made in five stages, and an attempt was made to separate those items of information which contributed to the changes in diagnosis.

Initial diagnoses of neuroses or toxic state were most susceptible to change, but the broad categories of organic, functional, and neurotic/normal were

stable in 86 per cent of patients. Information from relatives was responsible for almost one-third of the changes. Physical examination was particularly valuable in the correction of an initial diagnosis of senile dementia, and conceptual differences between doctors influenced shifts in affective and neurotic syndromes.

Information from relatives assumed a greater importance when only major diagnostic changes were concerned, though these represent only 2.1 per cent of possible changes. Psychological and physical tests rarely contributed to a diagnostic change, possibly because this information was only available at a late stage in the diagnostic process.

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**The Urban Distribution of Non-Fatal Deliberate Self-Harm.** By H. GETHIN MORGAN, HELEN POCOCK and SUSAN POTTLE.

In an attempt to avoid deficiencies inherent in current terminology such as attempted suicide, para-suicide, self-injury or self-poisoning, it is suggested that 'deliberate self-harm' is a useful alternative which is sufficiently general in meaning yet free from implied motive.

The incidence of non-fatal deliberate self-harm throughout the County Borough of Bristol during 1972 and 1973 was assessed by means of a survey of patients presenting to Accident and Emergency Departments of hospitals in the area. Fatal or repeat acts of self-harm were excluded from the survey.

The problem was found in all electoral wards of the city, though its distribution was markedly centripetal, with a central area having morbidity rates up to 2.8 times that for the city as a whole.

The socio-economic correlates of deliberate self-harm were examined by reference both to a series of 368 patients interviewed soon after the event, and to the pattern of its distribution throughout the city. A significant positive association was found with areas of overcrowding, lack of exclusive amenities and high proportion of foreign born residents, though there was no correlation with an index of social isolation as measured by the proportion of persons living alone nor with the type of accommodation. The central high rate area was found to be heterogeneous in socio-economic terms. The aetiological implications of the ecological findings are discussed.

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**Observations on the Dose Regimes of Fluphenazine Decanoate in Maintenance Therapy of Schizophrenia.** By D. A. W. JOHNSON.

The drug regimes prescribed for two separate groups of schizophrenic patients on maintenance therapy with fluphenazine decanoate are analysed. The results suggest important trends for the clinical use of long-acting injectable depot phenothiazines.

The scatter of drug prescriptions is so great that it is concluded that there is no such thing as a recommended dose regime in maintenance therapy; each patient must have his prescription determined on an individual basis. Only if this personalized approach is adopted can the side-effects be minimized with the greatest possible therapeutic gain. Over a period of 12 to 15 months the total dose required can be reduced in 40 to 50 per cent of patients. Independently of the dose changes per injection, the interval between injections can be increased in a substantial number of cases; so that after 12 months 62 per cent of patients only require injections every three weeks or even less frequently.

Despite the considerable variations in the individual response of patients, a trend was identified suggesting that the incidence of side-effects is 75 per cent if doses of 50 mg. per injection are used. If an injection dose of 25 mg. is used, the incidence is 60 per cent if the interval between injections is two weeks or less, but only 25 per cent if the interval is three weeks or longer. The risk with injections of 12.5 mg. is negligible. The types of dose variation likely to be encountered during maintenance therapy are described, including the adjustments required to abolish side-effects.

*D. A. W. Johnson,  
Crumpsall Hospital,  
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**Studies of Adoptees from Psychiatrically Disturbed Biological Parents: I. Psychiatric Conditions in Childhood and Adolescence.** By LYNN CUNNINGHAM, REMI J. CADORET, ROSEMARY LOFTUS and JAMES E. EDWARDS.

Psychiatric and behavioural problems were assessed in two groups of adoptees of median age 17 by interviewing the adopting parent. One adoptee group, the 'experimental' were the offspring of psychiatrically disturbed biological parents whose diagnosis was varied and ranged from mental retardation and anti-social personality to major psychoses. The 'control' adoptees were the offspring of psychiatrically normal biological parents. Both groups of adoptees had been separated at birth from their biological mothers and had no further contact with them or with other biological relatives. Interviews of the adopting relative

and diagnosis of biological parents and adoptees were carried out 'blind' to control or experimental status.

Significantly more experimental adoptees had psychiatric conditions requiring treatment than did control adoptees. In the experimental group, significantly more males were disturbed than females, and most of the sex difference was accounted for by males with childhood hyperactivity. There was evidence of some correlation between the psychiatric diagnosis of the biological parent and the affected adoptees. The data are consistent with the hypothesis of genetically transmitted discrete psychiatric conditions.

*Remi J. Cadoret,*  
*Department of Psychiatry,*  
*University of Iowa College of Medicine,*  
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*Iowa 52242, U.S.A.*

**Two Types of Insomnia: Too Much Waking or Not Enough Sleep.** By VLASTA BŘEZINOVÁ, IAN OSWALD and JOHN LOUDON.

The stability of sleep was examined in two kinds of induced insomnia, namely after caffeine administration and after hypnotic drug withdrawal. The duration of each episode of any one electrophysiological sleep stage or any episode of intervening wakefulness plus drowsiness was determined.

After caffeine there was an increase in longer episodes of intervening wakefulness plus drowsiness, but no significant change in the episode duration of any of the sleep stages. In the case of drug withdrawal, there was no change in the episode duration of intervening wakefulness plus drowsiness, but there was a significant shortening of episode duration in sleep stages 2 and 3+4, with a similar trend for REM sleep episodes.

Caffeine 'insomnia' thus seems characterized by increased stability of wakefulness, and hypnotic

withdrawal 'insomnia' by decreased stability of sleep. The type of analysis undertaken in this study could increase understanding of other types of insomnia.

*Vlasta Březinová,*  
*Department of Psychiatry,*  
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**Group Counselling of Alcoholics by a Voluntary Agency.** By J. S. MADDEN and W. H. KENYON.

The Merseyside Council on Alcoholism has developed a programme of group counselling for selected ambulatory alcoholics and their spouses. Group meetings are guided by leaders experienced in the care of alcoholics, who are drawn from several branches of the medical profession as well as from other disciplines. The first 98 alcoholics to participate in group counselling were followed up over a period ranging from a minimum of 6 to a maximum of 36 months. The number who remained abstinent throughout the observation time was 48; a further 15 underwent either one or two drinking relapses but were abstinent for at least six months prior to their final assessment. Although alcoholics who defaulted from group meetings after five or less attendances had a less favourable outcome than those who persevered, it is not claimed that group counselling produced the desirable sequelae; selection processes and previous forms of care could have contributed to the results. Nevertheless the substantial number of alcoholics who recovered suggests further development of the services provided by voluntary alcoholism agencies.

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This section of the *Journal* is discontinued from this issue

## Books Received

### BEHAVIOUR

- A Neurophysiological Model of Emotional and Intentional Behavior.** By J. L. WEIL. *Charles C. Thomas*. Price \$15.75.
- Life Stress and Illness.** Edited by E. K. E. GUNDERSON and R. H. RAHE. *Charles C. Thomas*. Price \$10.00.
- Occupational Stress.** Edited by A. McLEAN. *Charles C. Thomas*. Price \$9.75.
- Psychotherapy and Behavior Change 1973—An Aldine Annual on Practice and Research.** Edited by H. H. STRUPP *et al.* *Aldine Publications*. Price \$11.75.
- Operant Conditioning: An Experimental Analysis of Behaviour.** By D. BLACKMAN. *Methuen*. Price £3.20, £1.40 (paperback).

- COMMUNITY SOCIAL AND ALLIED MATTERS**
- The Future and Present Indicatives—Problems and Progress in Medical Care. Essays on Current Research.** Edited by G. McLACHLAN. *Oxford University Press*. Price £2.50.
- The Role of the Social Worker in the Psychiatric Services—Report on a Working Group.** Nice: 4th–7th September 1972. *W.H.O.* No price stated.
- Evaluation of Mental Health Education Programmes—Report on a Working Group.** Nancy: 21st–24th May 1973. *W.H.O.* No price stated.
- Research in Medical Care—Volume 30, No. 3, September 1974 issue of *British Medical Bulletin*.** *British Council*. Price £2.25.

### CHILDREN AND ADOLESCENTS

- Infants without Families and Reports on the Hampstead Nurseries 1939–1945.** By ANNA FREUD. *Hogarth Press and Institute of Psycho-Analysis*. Price £7.00.
- The World of the Child—Clinical and Cultural Studies from Birth to Adolescence.** Edited by T. TALBOT. *Jason Aronson*. Price \$15.00.
- The Competent Infant—Research and Commentary.** Edited by L. J. STONE, H. T. SMITH and L. B. MURPHY. *Tavistock Publications*. Price £11.00.
- Childhood Disorders—A Psychosomatic Approach.** By P. PINKERTON. *Crosby Lockwood Staples*. Price £3.75.
- Adolescent Patients in Transition—Impact and Outcome of Psychiatric Hospitalization.** By M. C. GROB and J. E. SINGER. *Behavioral Publications*. Price \$9.95.

### PSYCHOGERIATRICS

- Psychogeriatrics—An Introduction to the Psychiatry of Old Age.** By BRICE PITT. *Churchill Livingstone*. Price £2.25.

### SUICIDE

- The Prediction of Suicide.** Edited by A. T. BECK, H. L. P. RESNIK and D. J. LETTIERI. *Charles Press*. No price stated.

### PSYCHIATRY, PSYCHOANALYSIS AND PSYCHOLOGY

- The Schreber Case—Psychoanalytic Profile of a Paranoid Personality.** By W. G. NIEDERLAND. *Quadrangle*. Price \$8.95.
- Life History Research in Psychopathology.** Volume 3. Edited by D. F. RICKS, A. THOMAS and M. ROFF. *Oxford University Press*. Price £10.75.
- Clinical Neuropsychology—Current Status and Applications.** Edited by R. M. REITAN and L. A. DAVISON. *John Wiley*. Price £9.30.

### PENGUINS AND PELICANS

- The Meaning of Fear.** By S. RACHMAN. *Penguin Education*. Price 45p (paperback edition of book published in 1974).
- Social Therapy in Psychiatry.** By D. H. CLARK. *Pelican*. Price 45p.
- The Psychology of Human Ageing.** Second edition. By D. B. BROMLEY. *Penguin*. Price 75p.
- Playing and Reality.** By D. W. WINNICOTT. *Penguin*. Price 50p.
- Psychoanalysis and Women.** Edited by J. BAKER MILLER. *Penguin*. Price 75p.
- The Homeless Mind—Modernization and Consciousness.** By P. L. BERGER, B. BERGER and H. KELLNER. *Penguin*. Price 50p.

### MISCELLANEOUS

- Hemisphere Function in the Human Brain.** Edited by S. J. DIMOND and J. G. BRAUMONT. *Elek Science*. Price £7.50.
- The Primal Revolution.** By A. JANOV. *Garnstone Press*. Price £3.50.
- The Alexander Technique—the Essential Writings of F. Matthias Alexander.** Selected and with an introduction by E. MAIBEL. *Thames and Hudson*. Price £2.50.
- The Practical Management of Head Injuries.** By J. M. POTTER. Third edition. *Lloyd-Luke*. Price £2.00.
- Xenoglossy—A Review and Report of a Case.** By I. STEVENSON. *John Wright*. Price £4.00.

### FROM ABROAD

- Etologia e Psichiatria.** By A. BALESTRIERI, D. DE MARTIS and O. SICILIANI. *Laterza*. Price Lire 4000.
- Methodologie en Psychopharmacologie Clinique.** By J. COLLARD. *Masson et Cie*. No price stated.

Many of these books will be reviewed at a later date.

## Correspondence

Letters for publication in the Correspondence columns should be addressed to:

The Editor, British Journal of Psychiatry, Chandos House, 2 Queen Anne Street, London, W1M 9LE

### CHOREIFORM MOVEMENTS AFTER DEPOT INJECTIONS OF FLUPENTHIXOL

DEAR SIR,

I was most interested by Dr. Alan Gibson's account of chorea associated with flupenthixol (*Journal*, July 1974, p. 111). Unequivocal choreiform dyskinesia—'irregular and rapid darting, flexing, writhing or grimacing movements' (mainly around the mouth)—occurred in 41 per cent of a series of patients maintained on oral phenothiazines (Kennedy *et al.*, 1971); and Hunter *et al.* (1964) described irreversible movement disorders in minimally brain-damaged schizophrenics following the withdrawal of phenothiazines.

A 60-year-old ex-waitress with a very long history of schizophrenia and a tendency to drink to excess was, after four years in a mental hospital, placed on fluphenazine depot injections. She soon developed quasi-purposeful writhing and shock-like movements of her limbs, locking of her trunk, a tremulous undulating gait, grimacing, oral dyskinesia and ataxia, which persisted after the injections were stopped and failed to respond to a variety of anti-parkinsonian drugs. There was nothing in her life story suggestive of rheumatic fever, encephalitis or poisoning by carbon monoxide or heavy metal; nor was there any family history of spontaneous movements or of mental illness. The movements persisted over the three years for which I followed her up.

It would seem, therefore, that movement disorders, reversible and irreversible, can occur with both thioxanthenes and phenothiazines, whether given parenterally or orally.

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KENNEDY, P. F., HERSHON, H. I. & MAGUIRE, R. J. (1971) Extrapyramidal disorders after prolonged phenothiazine therapy. *British Journal of Psychiatry*, 118, 509-18.

### URINARY CYCLIC AMP AND DEPRESSION

DEAR SIR,

The implication by Hullin *et al.* (*Journal*, November 1974, p. 457), that the 24-hour urinary excretion of cyclic AMP is not related to mood in affective disorders is in direct conflict with our findings in a double blind study of depressed patients and control subjects in which we measured the 24-hour urinary excretion of cyclic AMP in 27 patients suffering from 'classical endogenous' depression, 15 patients suffering from 'classical neurotic' depression and 25 healthy control subjects.

Comparison of mean and S.D. of urinary cyclic AMP  
( $\mu$  mole/24 hr.) in the first 24-hour urine samples

|         | Control<br>(N = 25) | Neurotic<br>(N = 15) | Endogenous<br>(N = 27) |
|---------|---------------------|----------------------|------------------------|
| Mean .. | 3.98                | 2.27                 | 2.88                   |
| S.D. .. | $\pm 1.55$          | $\pm 1.77$           | $\pm 1.55$             |

Difference between control and neurotic significant  
 $P < 0.0025$ .

Difference between control and endogenous significant  
 $P < 0.01$ .

Difference between endogenous and neurotic non-significant  
 $P < 0.20$ .

(Student's 't' test used for comparison of means.)  
(N = number of subjects sampled.)

It can be seen from the above table that depressed patients showed a very significantly decreased 24-hour urinary excretion of cyclic AMP when compared to control subjects. This decreased level of 24-hour urinary cyclic AMP increased significantly to reach and maintain control values as the patients recovered, while the 24-hour urinary excretion of cyclic AMP by the control subjects remained constant. Naylor *et al.* (*Journal*, September 1974, p. 275) reported that in 12 female patients recovering from a depressive psychosis the 24-hour urinary excretion of cyclic AMP increased significantly with recovery, which supports our findings.

Hullin *et al.* report on an example, not a sample, and therefore their conclusions are open to statistical criticism. It would be extremely interesting if they



would tell us the normal 4-hour urinary excretion of cyclic AMP in control subjects and if they could compare this with data collected from sufficient patients who exhibit a rapid change in mood to make a sample large enough from which to draw a statistically valid conclusion.

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W. CLAYTON-LOVE.

ATHENE M. B. KEATINGE.

*Clinical Biochemistry Laboratory,  
Trinity College, Dublin 2.*

#### EMOTIONAL ILLNESS IN PSYCHIATRIC TRAINEES

DEAR SIR,

Dr. Waring's study (*Journal*, July, 125, 10-11), contains, I believe, two serious methodological problems which may largely invalidate his findings. First, the General Health Questionnaire, as the author correctly states, is a '... reliable, valid and sensitive screening schedule for detecting emotional illness in general practice'. The same cannot, unfortunately, be assumed for the population to which it was applied. Secondly, as I am informed by Dr. Waring, the covering letter to those doctors in the control group began as follows:

'Dear Doctor:

I have been carrying out a study at the Institute of Psychiatry on attitudes, personality features and emotional factors in doctors training in psychiatry. Over 86 per cent of the doctors in the survey at the Institute have kindly responded. I am in need of a control group of doctors in training, but not training in psychiatry, etc.' Thus these respondents knew they were to be a control group and further that the study concerned assessment of their colleagues in psychiatry. One can only speculate on how this may have biased the outcome.

I believe we must consider the questions posed by Dr. Waring as still unanswered.

PAUL LATIMER.

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#### COMBINED ANTIDEPRESSANT MEDICATION

DEAR SIR,

There is still much controversy concerning the relative benefits and potential hazards of using

combined antidepressant medication, namely the concurrent administration of a tricyclic antidepressant and a monoamine oxidase inhibitor (MAOI) (1). Winston (2), Schuckit *et al.* (3) and Sethna (4) have put forward the case for combined antidepressant treatment in refractory cases that do not respond to one or other treatment alone, and psychiatrists at St. Thomas' Hospital are well known for their views that many more depressed patients could be successfully treated if doctors were less fearful of the hazards of combined antidepressant medication.

Successful results were obtained by Winston (2) using 25 to 100 mg. amitriptyline daily combined with isocarboxazid, 10 to 20 mg. daily, whereas Sethna (4) used 50 to 75 mg. amitriptyline daily with phenelzine 15 mg. three times a day. Further, Pollitt (5) reports good results using only small daily doses of amitriptyline (50 mg.) combined with isocarboxazid or phenelzine. If combined antidepressant medication is more effective than either antidepressant alone it is of importance to discover the pharmacological basis for this apparent synergism.

The effect of many drugs is said to be potentiated by the concurrent administration of MAO inhibitors (including tricyclic antidepressants), narcotics, barbiturates, tranquillizers, anaesthetics and alcohol (1, 6). Because of their 'enzyme-inhibiting' properties, the MAOI drugs have been reported by some workers to interfere with the hepatic microsomal enzyme system which is responsible for the metabolism of many of the above mentioned drugs, including the tricyclic antidepressants (6-10).

We wish to report our observations of the effect of MAOI (isocarboxazid) administration upon plasma concentrations of a tricyclic antidepressant (amitriptyline). Eight patients from an out-patient clinic were selected for the study; six were receiving 50 mg. amitriptyline at night and two 25 mg. nightly. One patient was also receiving diazepam, but the dose was not changed throughout the duration of the study. Isocarboxazid in daily divided doses of 15 to 20 mg. was given to or withdrawn from patients who were already receiving amitriptyline. Heparinized venous blood samples were obtained from each patient before, during, and/or after at least one month of combined tricyclic/MAOI administration, at the same time of day (3.00 p.m.) on each occasion. Plasma samples were analysed for amitriptyline and its major active metabolite, nortriptyline, using a gas-chromatographic technique (11) which has a lower limit of sensitivity for both drugs of approximately 20 ng./ml.

Results in all eight patients showed that plasma levels of both amitriptyline and nortriptyline did not exceed 30 ng./ml. before, after or during combined antidepressant administration. Even though it was

difficult to be exact in quantitating plasma levels below 30 ng./ml., close inspection of the results obtained indicated that in no case had MAOI administration produced a significant increase in amitriptyline or nortriptyline plasma concentrations.

It would appear from these preliminary results that the synergic effect obtained with combined antidepressant medication is due to a potentiation of effect at central noradrenergic and serotonergic neurones, rather than through any inhibition of tricyclic drug metabolism.

In this study we did not try to assess changes in the psychiatric state of patients. It would be interesting to repeat the study using either larger doses of tricyclic drug or more sensitive analytical methods, and to correlate tricyclic antidepressant plasma levels with clinical response. This matter is now under consideration. We wish to thank Dr. Pollitt for his help in this study.

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ROBIN BRAITHWAITE.

*Poisons Unit,  
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London, S.E.1.*

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11. BRAITHWAITE, R. A. & WIDDOP, B. (1971) A specific gas-chromatographic method for the measurement of 'steady-state' plasma levels of amitriptyline and nortriptyline in patients. *Clin. Chim. Acta*, **35**, 461–72.

#### DEPENDENCY AND OVERPROTECTION IN BOYS WHO STEAL

DEAR SIR,

We would like to report the results of giving the Self Administered Dependency Questionnaire (SADQ) to the mothers of 42 boys coming to a child guidance clinic in Yorkshire with a main complaint of stealing. Thirty-eight other boys referred for psychiatric treatment and thirty-four boys referred for psychological testing because of educational problems were used for purposes of comparison. The questionnaire has been described previously (Berg, 1974). The SADQ was employed by one of us (H.S.) in this connection as part of a larger research project. The three groups of boys did not differ significantly on age (combined total mean age 9.5 years), social class distribution, IQ (combined total mean full scale IQ on the WISC 95.2) or RQ (combined total mean on the Schonell 78).

The group of stealers had a significantly lower mean actual communication score (2.5) than either the psychiatric (4.2) or the educational (5.3) controls. Previously 64 primary school children from the general population were found to have a mean of 6.0; S.D. = 3 (Berg, 1974). Actual affection, assistance and travel mean scores did not differ significantly. The four types of preference score (Berg and McGuire, 1974) compared across the three groups for three levels of actual score, using two-way analysis of variance, failed to show any significant differences.

The stealers were significantly antisocial in other ways and were considered to be suffering from conduct disorders. The SADQ findings suggest that conduct-disordered boys who steal may be unusually uncommunicative and their mothers unconcerned about this state of affairs.

IAN BERG, H. SANDERSON.

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THE USE OF THE W.H.O.  
INTERNATIONAL CLASSIFICATION OF  
DISEASES (MENTAL RETARDATION) IN  
A HOSPITAL FOR MENTALLY  
HANDICAPPED

DEAR SIR,

We have been using the W.H.O. system and coding for patients admitted to Burderop and Pewsey and North View Subnormality Hospitals. I agree with the comments by Dr. Spencer (*Journal*, October 1974, 125, 333-5), and think that the *Glossary* should be used in the classification of residents in hospitals for the mentally handicapped.

I was, however, sorry to see that Dr. Spencer had made little or no reference to additional diagnostic categories outside the range 310-315, since a fairly high proportion of patients at the above three hospitals were admitted on account of mental disturbances other than mental handicap. Mentally handicapped people tend to suffer more mental illnesses and mental disturbances than people of average intelligence. I draw particular attention to the diagnostic category 309 (Mental disorders not specified as psychotic, associated with physical conditions), 307 (Transient situational disturbances), 301 and 302 (Personality disorders and sexual deviation), 300 (Neuroses), 295 (Schizophrenia), 293 and 294 (Psychosis associated with various physical conditions), etc.

If double diagnoses on the W.H.O. classification are not given on mentally handicapped patients admitted to subnormality hospitals, the diagnostic information will frequently be inadequate. There are people who question the value of subnormality hospitals. Conscientious attention paid to the whole variety of mental disturbances occurring in mentally handicapped people provides a proper basis for discussion. Diagnoses limited to the level of IQ and the aetiology of mental retardation are valuable but often incomplete.

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PSYCHOSEXUAL DISORDERS

DEAR SIR,

The study of psychosexual disorders is a growing-point in psychiatry today.

Under this heading a distinct corpus of knowledge and specific therapeutic skills has developed. Many doctors will wish to gain more familiarity with this subject. It is important that psychiatrists in training should receive adequate instruction and practical experience in this branch of psychiatry, since an appreciable number of patients referred to psychiatric clinics present with psychosexual problems. In the management of these cases a number of wider ethical issues emerges.

There may, therefore, well be scope to have a special study-group or Section within the Royal College of Psychiatrists to take a special interest in psychosexual disorders.

D. A. SPENCER.

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Corrigenda

TEMPERATURE FALL AFTER ECT

Dr. P. V. F. COSGROVE writes: 'Thank you for publishing my letter on "Temperature Fall after ECT" in the November issue (p. 516). Unfortunately in checking through the letter I sent you I failed to notice the omission of a rather crucial decimal point. The temperature drop was not between 2° and 5°C, but was in fact between .2° and .5°C.'

BATTERED WIVES

Dr. S. MACKEITH writes: 'On page 441 of your issue of November 1974, Dr. Peter Scott lists the members of a committee of the Royal College of Psychiatrists, of whose report on "Battered Wives" his paper is an abbreviated version. One member is named as "Dr. James McKeith". This should be "MacKeith".'

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